

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

DIESEL PROGRESS



WINNER OF THE

DIESEL PROGRESS

ANNUAL REA EFFICIENCY AWARD

FIVE DOLLARS PER YEAR

APRIL, 1953

FIFTY CENTS PER COPY

NO STUCK RINGS IN 117,935 ENGINE HOURS

This Nordberg Diesel
lubricated with
TEXACO URSA OIL

For a real "workhorse" we give you this 1500 h.p. Nordberg Diesel in the Sioux Falls, S. D., municipal power plant. It has been in service 96% of the time for 14 years, running up a total of 117,935 engine hours. Says A. T. Hanson, Chief Engineer —

"We *have* to have effective lubrication to maintain our operating schedule. The efficacy of *Texaco Ursa Oil* in this engine is indicated by the fact that we have never found a stuck ring and — even after 117,935 engine hours — all but one of the engine's original cylinder

liners are still in service."

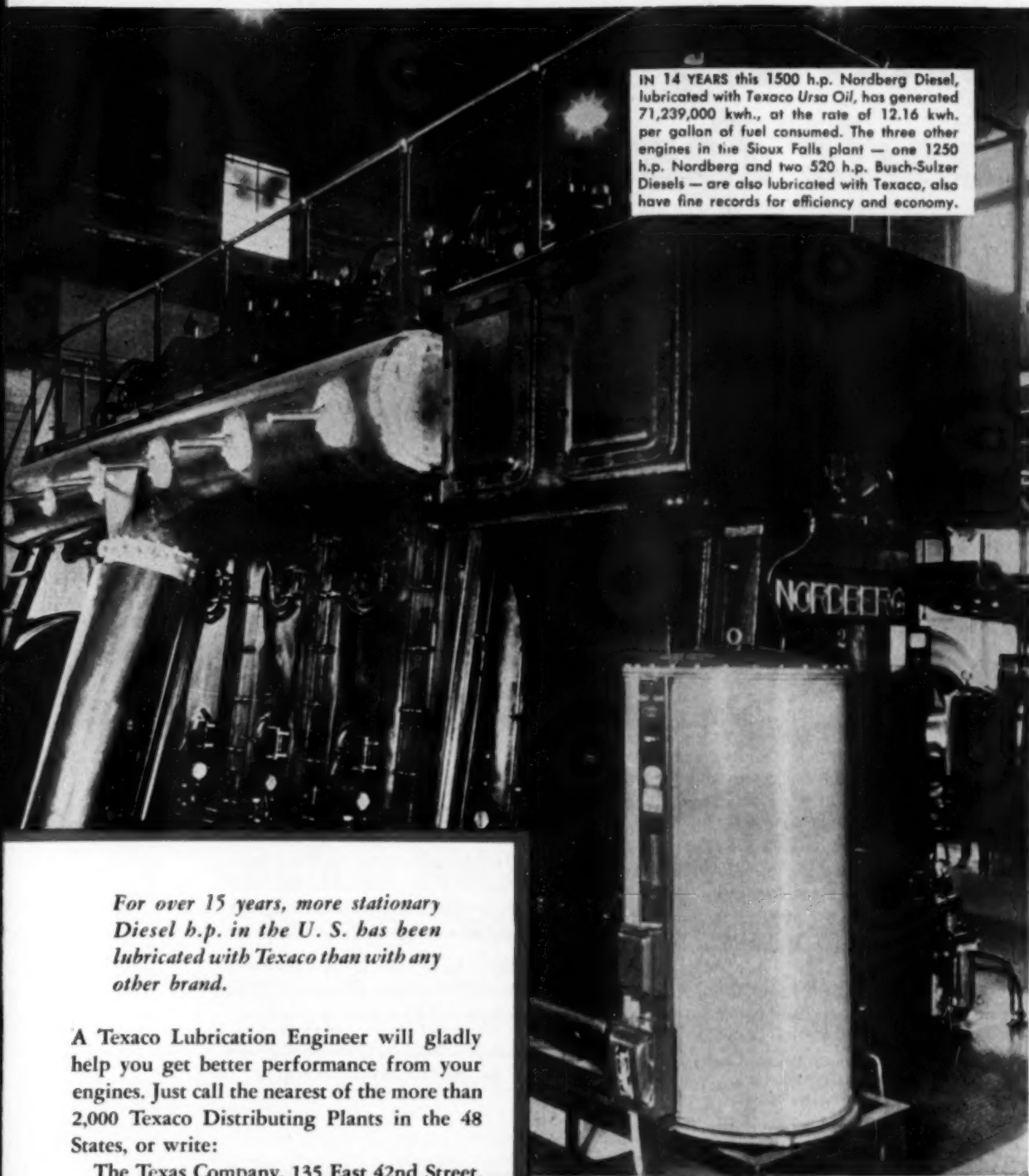
In addition, lube oil consumption has been impressively low — an average of 4,855 h.p. hours per gallon of *Texaco Ursa Oil* for the last year reported.

Everywhere, *Texaco Ursa Oil* keeps efficiency high, maintenance costs and fuel consumption low. There is a complete line of *Texaco Ursa Oils* to assure top performance from Diesel, gas and dual-fuel engines. They are approved by leading engine builders and preferred by operators. In fact —

TUNE IN . . . TEXACO
STAR THEATER
starring MILTON BERLE,
on television
Tuesday nights
METROPOLITAN OPERA
radio broadcasts
Saturday afternoons.



TEXACO



IN 14 YEARS this 1500 h.p. Nordberg Diesel, lubricated with Texaco Ursa Oil, has generated 71,239,000 kwh., at the rate of 12.16 kwh. per gallon of fuel consumed. The three other engines in the Sioux Falls plant — one 1250 h.p. Nordberg and two 520 h.p. Busch-Sulzer Diesels — are also lubricated with Texaco, also have fine records for efficiency and economy.

For over 15 years, more stationary Diesel h.p. in the U. S. has been lubricated with Texaco than with any other brand.

A Texaco Lubrication Engineer will gladly help you get better performance from your engines. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

URSA OILS

**FOR ALL DIESEL, GAS
AND DUAL-FUEL ENGINES**

Moves big payloads faster



—at lower cost

Big earth-moving vehicles like this twin-engine self-loading scraper get more work done faster because of Allison TORQMATIC DRIVES. These time-proved hydraulic drives — more than 10,000 have been built for Army tanks and heavy-duty vehicles—make multiple engine applications possible—and practical.

TORQMATIC DRIVE provides a smooth, steady, oil-cushioned flow of power—high-starting torque with uninterrupted acceleration—protection against shock-

load damage to engines and equipment. It eliminates engine lugging and stalling while maintaining power to drive wheels at all times. This permits the engine to operate in its most effective speed range by balancing engine power with load requirements.

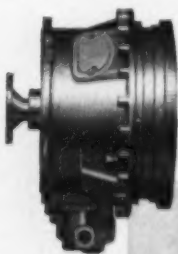
Users of trucks, scrapers and other vehicles equipped with TORQMATIC DRIVE report up to 30% more work done and 15% less cost per yard than with a mechanical drive — additional good reasons why engineers are designing Allison TORQMATIC DRIVES

into all types of heavy-duty equipment.

Allison TORQMATIC DRIVES are the only heavy-duty full torque-shifting vehicle transmissions available today—engineered for compactness, permitting flexibility of drive-train design for today's and tomorrow's vehicles.

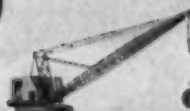
Like to know more about TORQMATIC DRIVES? Write us for Engineering Data Bulletin which gives full specifications.

ALLISON Division of GENERAL MOTORS
Box 894DD, Indianapolis 6, Indiana



Compact,
efficient
hydraulic
drive for . . .

Allison TORQMATIC DRIVES



CRANES



TRACTORS



TRUCKS



SHOVELS



LOCOMOTIVES



DRILLING RIGS



Air-Maze filters on Cooper-Bessemer engines help Wolverine Cooperative win "most efficient" award

ENGINES, transformers, plant design—all contributed to the overall plant efficiency of Wolverine Electric Cooperative, this year's winner of "THE MOST EFFICIENT REA PLANT" award. Another big contribution was made by the two Air-Maze oil-bath filters and one DH panel assembly on the intakes of three Cooper-Bessemer dual fuel engines.

Air-Maze oil-bath filters scrub intake air in a pool of oil. An oil-washed screen filter traps any remaining dust, passing only clean, oil-free air. Air-Maze type DH ("dog

house") panel assemblies clean intake air by trapping dirt in flat panel type filters. Abrasive dust and dirt can't get through to damage polished engine parts. Engines run smoother, wear is reduced, efficiency increased.

Thousands of America's diesels rely on Air-Maze filters for clean air, clean fuel oil, clean lube oil. They're specified by leading diesel engine manufacturers throughout the country. For full information on the hundreds of filter types and sizes engineered by Air-Maze, write the Air-Maze Corporation, Cleveland 28, Ohio.

The biggest names in diesels are protected by Air-Maze filters

AIR FILTERS
SILENCERS
SPARK ARRESTERS

AIR-MAZE
The Filter Engineers

LIQUID FILTERS
OIL SEPARATORS
GREASE FILTERS

Best Buy

...Here's Why!

Aeroquip Detachable, Reusable Fittings reduce hose line inventory. For on-the-spot replacements cut bulk hose to required length and attach fittings.

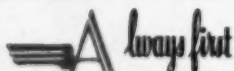
Unique Fitting design provides quick, easy assembly and assures positive grip on hose. No adjusting is required after assembly.

Hose is constructed of seamless synthetic rubber compound reinforced with two cotton braids and a high tensile steel wire braid.

Wide range of male and female end fittings in all sizes meet practically every requirement. Fittings are designed to SAE and JIC specifications.

Tough, durable Aeroquip Hose Lines are fire resistant. They perform satisfactorily at extreme temperatures—from -40° to $+275^{\circ}$ F.

Aeroquip Hose Lines are widely used with hydraulic fluids, lubricants, water, gasoline, Diesel fuel, air, and many other fluids.



AEROQUIP FLEXIBLE HOSE LINES OUTSELL ALL OTHERS
FOR INDUSTRIAL AND AIRCRAFT APPLICATIONS

Aeroquip

AEROQUIP CORPORATION, JACKSON, MICHIGAN

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AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

THE ENGINEER'S REPORT

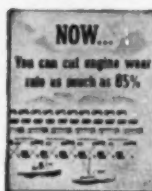
	DATA
LUBRICANT	RPM Delo Oils
UNITS	Allis-Chalmers HD 20's & 19's
OPERATION	Clearing timber land for reservoir
CONDITIONS	Heavy pulling and bulldozing
FIRM	Paul C. Helmick Co., Seattle, Wash.

No stuck rings in 14 months of unusually tough work!

CLEARING 4000 ACRES OF TIMBER LAND in 14 months is the tough job being completed by these big Allis-Chalmers diesels, owned by Paul C. Helmick Co., Seattle, on Bureau of Reclamation job at Cascade, Idaho. Yet, lubricated with RPM DELO Special Lubricating Oil, there was not a single stuck ring or bearing failure in the entire period! Timber was pulled down in 30 ft. swaths by a 130 ft. anchor chain hooked to two of the 275-h.p. HD 20's; logs were bucked into piles and burned.



ENGINE PARTS WERE KEPT CLEAN by the special ingredients of RPM DELO Oils. The representative piston, sleeve, wrist pin, and con-rod bearing shown in this unretouched photograph, indicate the minimum carbon deposits. Assembly was pulled for inspection when the A-C unit was in for check-up... and put back in service as is.

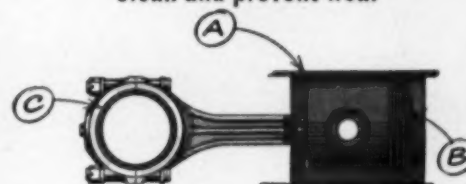


There is an RPM DELO Oil to meet every heavy-duty engine operation condition. FREE BOOKLETON the RPM DELO Oils gives you complete information. Write or ask for it today.



TRADEMARK "RPM DELO" REG. U.S. PAT. OFF.

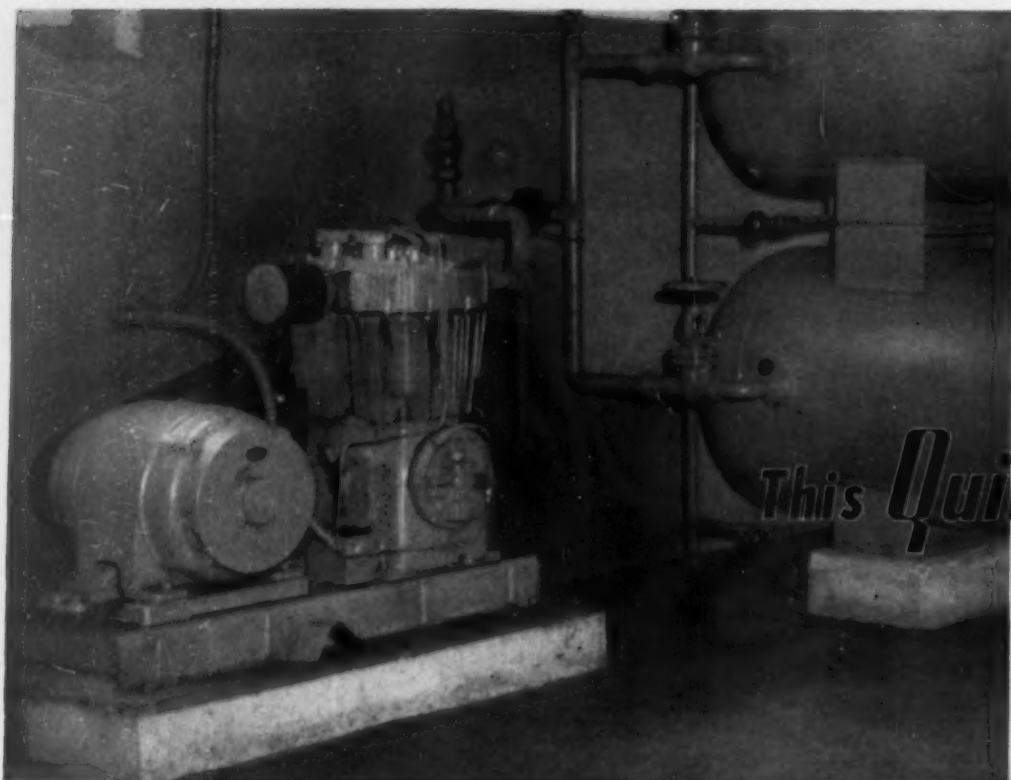
How RPM DELO Oils keep engines clean and prevent wear



- A. Contain special additives that provide metal-adhesion qualities...keep oil on parts whether they are hot or cold, running or idle.
- B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean, helps prevent scuffing.
- C. Special compounds stop corrosion of bearing metal, and oil foaming in both wet and dry sump engines.

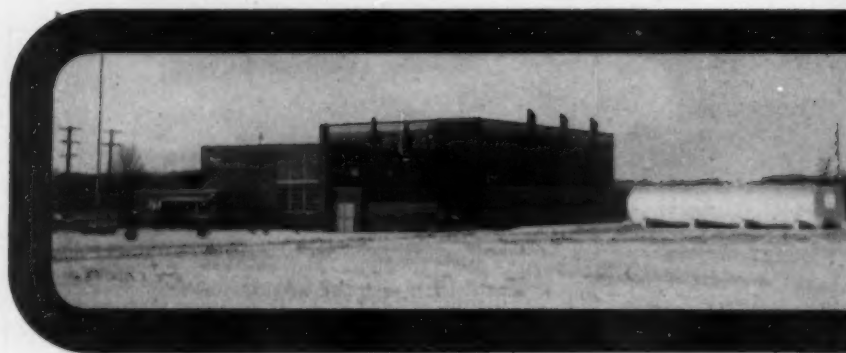
FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor handling them, write or call any of the companies listed below.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado



This Quincy compressor

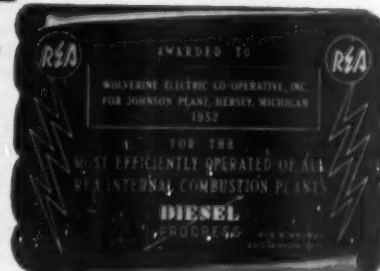
gives efficient starts for these diesels in . . .



**. . . the most efficient
REA plant of 1952**

Wolverine Electric Cooperative, Big Rapids, Mich.

You'll enjoy award-winning efficiency and dependability with a Quincy Compressor, too. Quincy Compressors are modern, compact, rugged and they can be counted on when needed. There's a Quincy Compressor for *your* job. Depend on a Quincy specialist to help you select the type and size (from 1 to 90 c.f.m.) to meet your specific needs.



Quincy Compressors are Manufactured by
Quincy Compressor Co. Quincy, Illinois

Branch Offices:
New York • Philadelphia
Detroit • Chicago • St. Louis
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2100-TPA-2114

Light Sleeper...

How quickly do you wake up?

In case normal line power should fail at Northwestern Bell Telephone Company in Minneapolis, the sensitive standby power plant above pops awake in seconds, starts delivering critical emergency power.

This ever-alert protection is supplied by an E-M, 1250 KVA, 720 rpm Synchronous Generator driven by a diesel engine. A system of relays starts the unit instantly if line power is interrupted... all the calls from Northwestern Bell's 93,000 downtown telephones can then be carried on by standby power.

You'll find hundreds of other E-M Standby Generators ready for action in exacting emergency situations all over the world. Each E-M Generator has been individually tailored to specific requirements. These accomplishments have made E-M engineers specialists in solving original design problems.

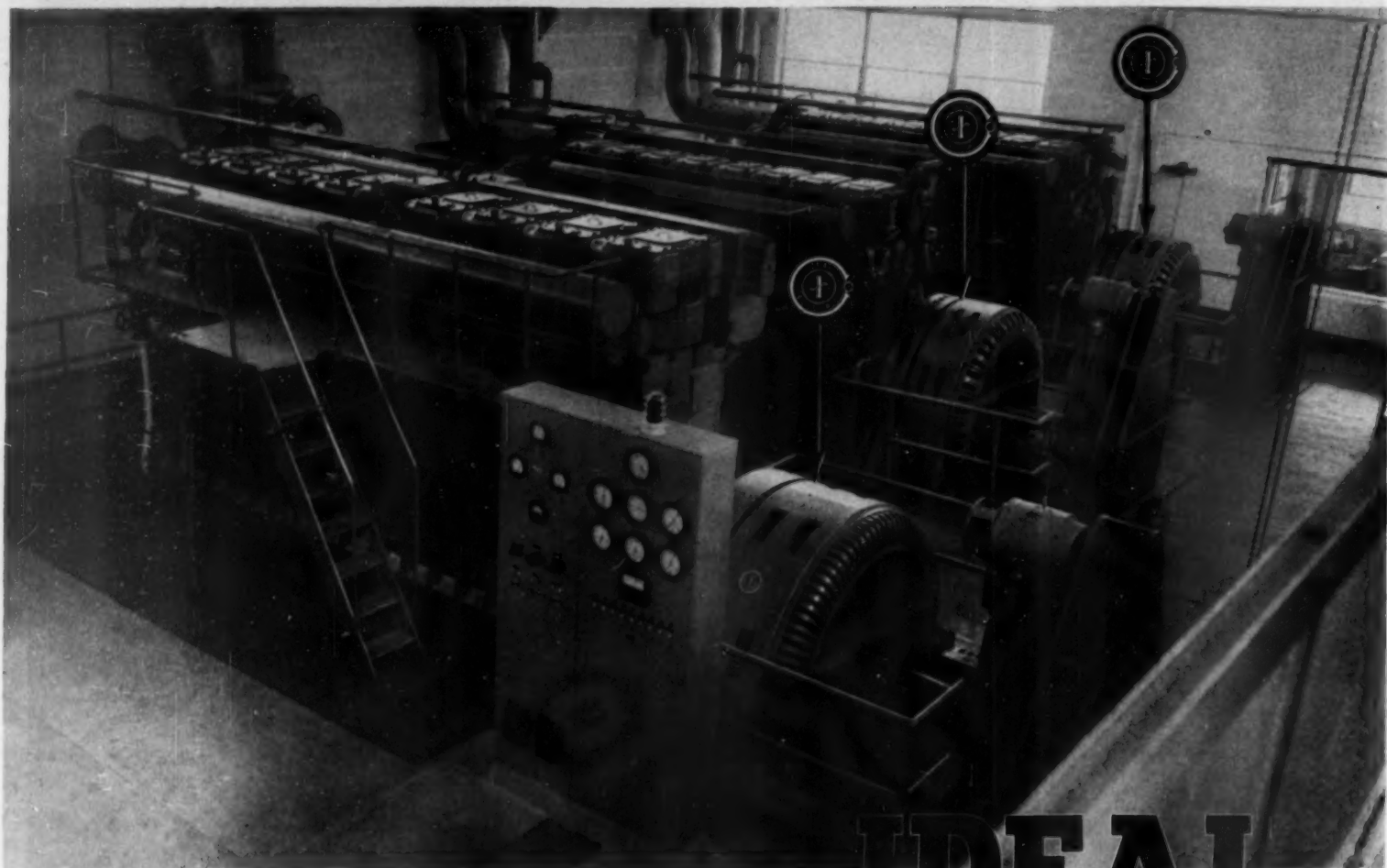
If you have no emergency protection, or feel your present equipment may be inadequate, ask your nearest E-M sales engineer for his suggestions. Also, write for Issue No. 35 of the E-M *Synchronizer*, illustrating the full line of E-M Generators. It has a special section on emergency power.

ELECTRIC MACHINERY MFG. CO.
MINNEAPOLIS 13, MINNESOTA



A complete line of AC generators for standby sets

EFFICIENCY THAT MAKES A WINNER!



Three Ideal engine type generators driven by Cooper-Bessemer diesel engines in the Hersey, Michigan plant of the Wolverine Electric Co-operative, Big Rapids, Michigan.

In the foreground is a 1456 KVA, 1165 KW, 80% PF, 327 R.P.M., 3 phase, 60 cycle, 2400 volt, Type SAM, 50°C. Syn. Generator.

Next to it is a 838 KVA, 670 KW, 80% PF, 360 R.P.M., 3 phase, 60 cycle, 2400 volt, type SAM, Syn. Generator.

On the far side is a 838 KVA, 670 KW, 80% PF, 360 R.P.M., 3 phase, 60 cycle, 2400 volt, Type SAM, 40°C. Syn. Generator.

IDEAL GENERATORS

Make the First Team

The winner of the 1952 annual award by Diesel Progress for the most efficiently operated of all REA plants is the Wolverine Johnson plant, Hersey, Michigan, which supplies power for three Distributing Cooperatives serving nearly a third of the state of Michigan.

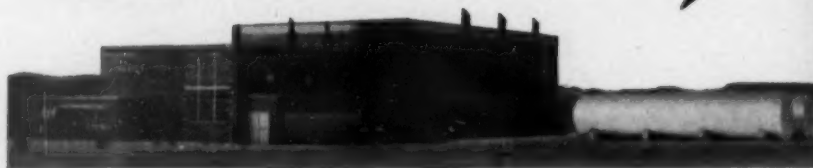
Top quality equipment that can be depended upon for long periods of trouble free operation at top efficiency is necessary to win this coveted award. Three Ideal Generators are in operation at this plant. Ideal Generators are top quality because they are built by a company with 50 years experience in the business of designing and building highly efficient dependable generators.

During these 50 years Ideal has established an enviable reputation for top quality, top performance and efficiency in its products, many of which have contributed to the successful operation of power plants throughout the world.

We take pride in the part played by The Ideal Electric & Manufacturing Company, whose top quality generators helped the Wolverine REA Plant to win the Diesel Progress Award for 1952.



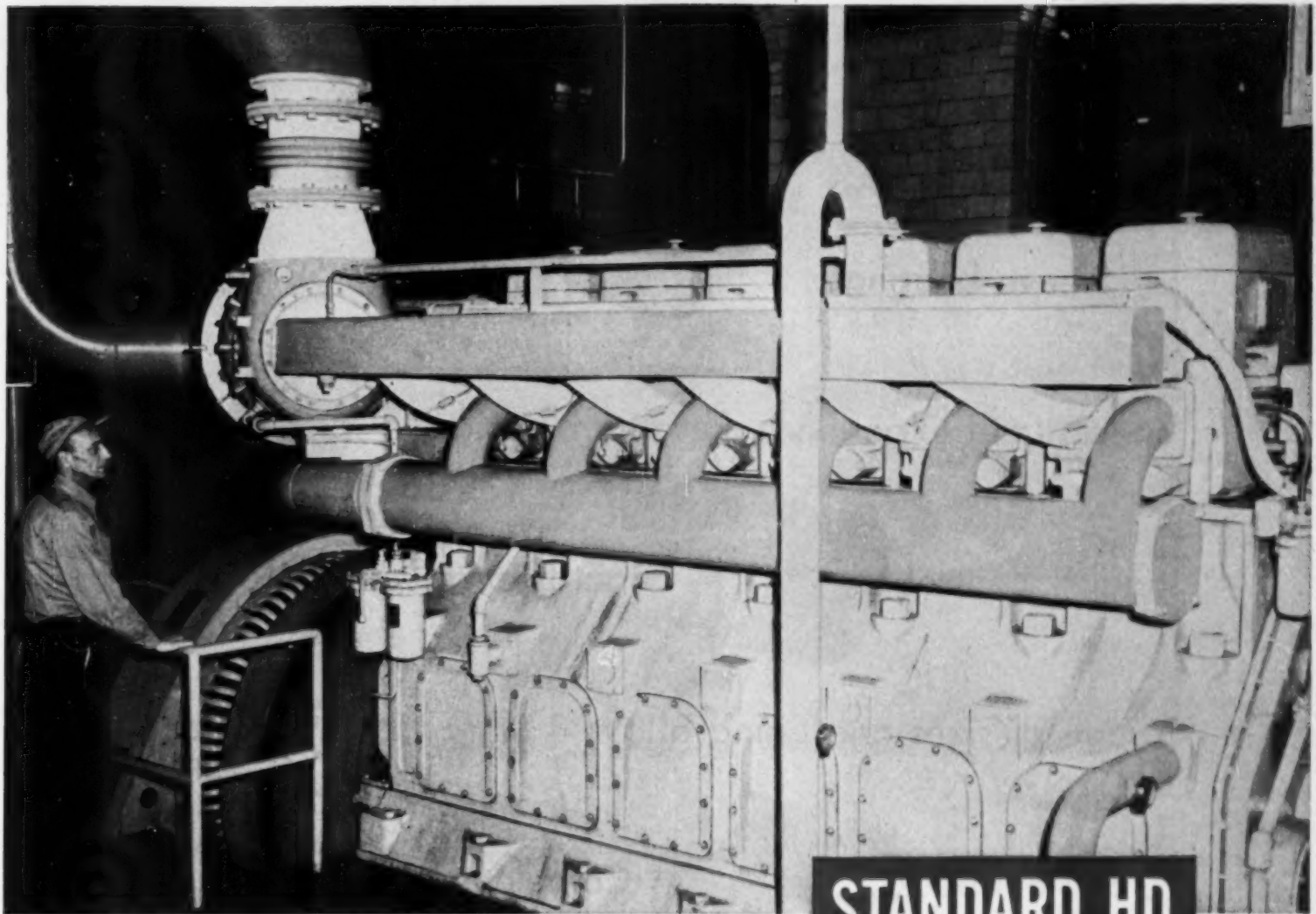
This Bronze Plaque was presented to Wolverine Electric Co-operative as the winner of the 1952 Diesel Progress efficiency award. The Johnson Plant winning this honor is located at Hersey, Michigan.



The IDEAL ELECTRIC
& Manufacturing Co., Mansfield, Ohio
U. S. A.

BUILDERS OF DEPENDABLE POWER EQUIPMENT FOR 50 YEARS

DIESEL PROGRESS



STANDARD HD
TRADE MARK
OIL

Gets maximum protection with...

● At the time this supercharged diesel engine was installed in a municipal power plant, STANDARD HD Oil had already established an outstanding record for effective lubrication in the plant's other units. In the new unit, STANDARD HD has set a new high for efficient performance.

Most of the plant's load has been carried by the new, supercharged unit. In two years of continuous, hard service, STANDARD HD has supplied clean, protective lubrication. There have been no shut-downs for oil system maintenance. The original fill of oil has never been changed and has remained in excellent condition, as shown by periodic tests of oil samples.

The experience of this power plant, and that of a

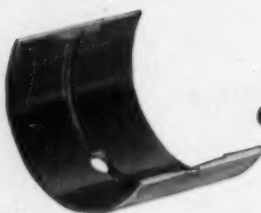
host of midwest diesel operators, indicates the savings you can make with STANDARD HD. The Standard Oil lubrication specialist serving your section of the Midwest will be glad to give you information about the use of STANDARD HD in plants near your own with which you may be familiar. You can contact the lubrication specialist by phoning your local Standard Oil office. Or write: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY



(Indiana)

Sleeve bearings . . . more than 50 years
 specialized experience. Research, design,
 quality control, quantity production. Widest
 range of sizes and lining alloys on bronze
 or steel backs. Complete engineering
 service. Long or short runs for automotive
 and industrial requirements.

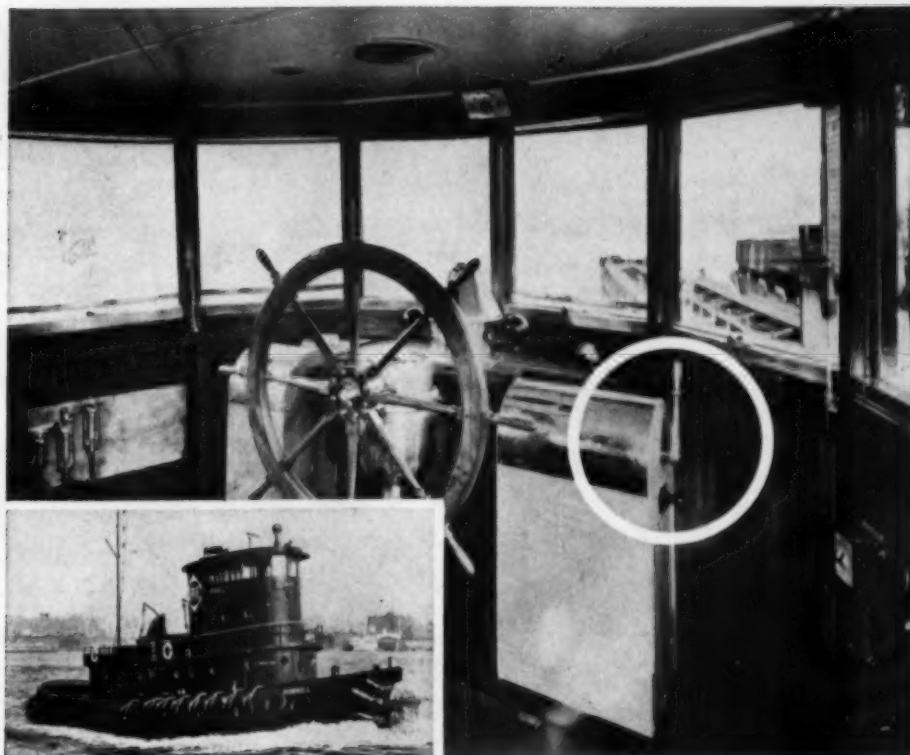


Sleeve bearings in all designs
 and sizes • Cast bronze bush-
 ings • Rolled split-type bushings
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 cision bronze parts • Bronze bars

FEDERAL-MOGUL CORPORATION
11039 SHOEMAKER, DETROIT 13, MICH.



FEDERAL-MOGUL



FULL AHEAD TO FULL ASTERN WITH A TWIST OF THE WRIST

The safety of a tug and of a valuable cargo depends on how quickly she answers her skipper's demands.

When she has General Motors Diesel-Electric Drive, the captain gets his wish with a twist of the wrist—not even the time lag of a bell—no chance of misunderstood signals.

To this maneuverability, add long life and reliability and you have some of the reasons why GM Diesels are in thousands of commercial, Navy and Coast Guard ships.



Tie up to GM Service



CLEVELAND DIESEL ENGINE DIVISION

GENERAL MOTORS • CLEVELAND 11, OHIO

ENGINES FROM 150 TO 2000 H. P.

Sales and Service Offices: Cambridge, Mass. • Chicago, Ill. • Jacksonville, Fla. • Miami, Fla. • Montreal, P. Q. • New Orleans, La. • New York, N. Y. • Norfolk, Va. • Orange, Texas • San Diego, Calif. • San Francisco, Calif. • Seattle, Wash. • St. Louis, Mo. • Tampa, Fla. • Toronto, Ont. • Vancouver, B. C. • Washington, D. C. • Wilmington, Calif.

Visit the Tycol Exhibit!
American Society of Lubrication Engineers
Hotel Statler, Boston, Mass.
April 13-15



...with TYCOL lubricants on hand!

Take heavy mechanical equipment, for instance. There's a Tycol lubricant for any application you name: For instance, what about steam turbines? . . . Tycol Aturbrio oils resist heat and sludging, are "double inhibited" to provide the utmost resistance to rust and oxidation. Diesels? . . . Tycol Adelbus oils contain additives that produce a tough "film of protection" and help to eliminate sludge and varnish. You always get top performance with Tycol lubricants. Why? . . . Because each Tycol grease and oil is manufactured from high quality base stocks and *tailored* for a specific application. Get the full story of the entire Tycol line from your local Tide Water Associated office today!

**Over 300 Tycol Industrial lubricants are at
your disposal . . . engineered to fit the job!**

REFINERS AND MARKETERS OF VEEDOL . . . THE WORLD'S MOST FAMOUS MOTOR OIL



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SEALED-IN POWER! International diesels are built to maintain full power day after day—even in dust like this.

“TURNS ROCK TO DUST IN ONE OPERATION”

Hamilton Lime Company, Paris, Missouri, Really Knows Value of “Power That Pays!”

A tough combination—an International UD-18 and a UD-24 in a double hook-up—smash out thousands of tons of agricultural lime and road rock every year for Charles Hamilton.

Owner Hamilton knows how much Internationals do for him. He says:

“It really takes power to turn solid rock into dust in one operation. These two Internationals turn out 300 tons of limestone dust in 10 hours and run smooth all the time. Here at the quarry an engine gets put thru the rough dust treatment. Years of good service proved our Internationals can take it.”

Internationals that can do a good job like this can do a good job for you. See your International Industrial Distributor. See International power on the job. Get the facts on “Power that Pays!”

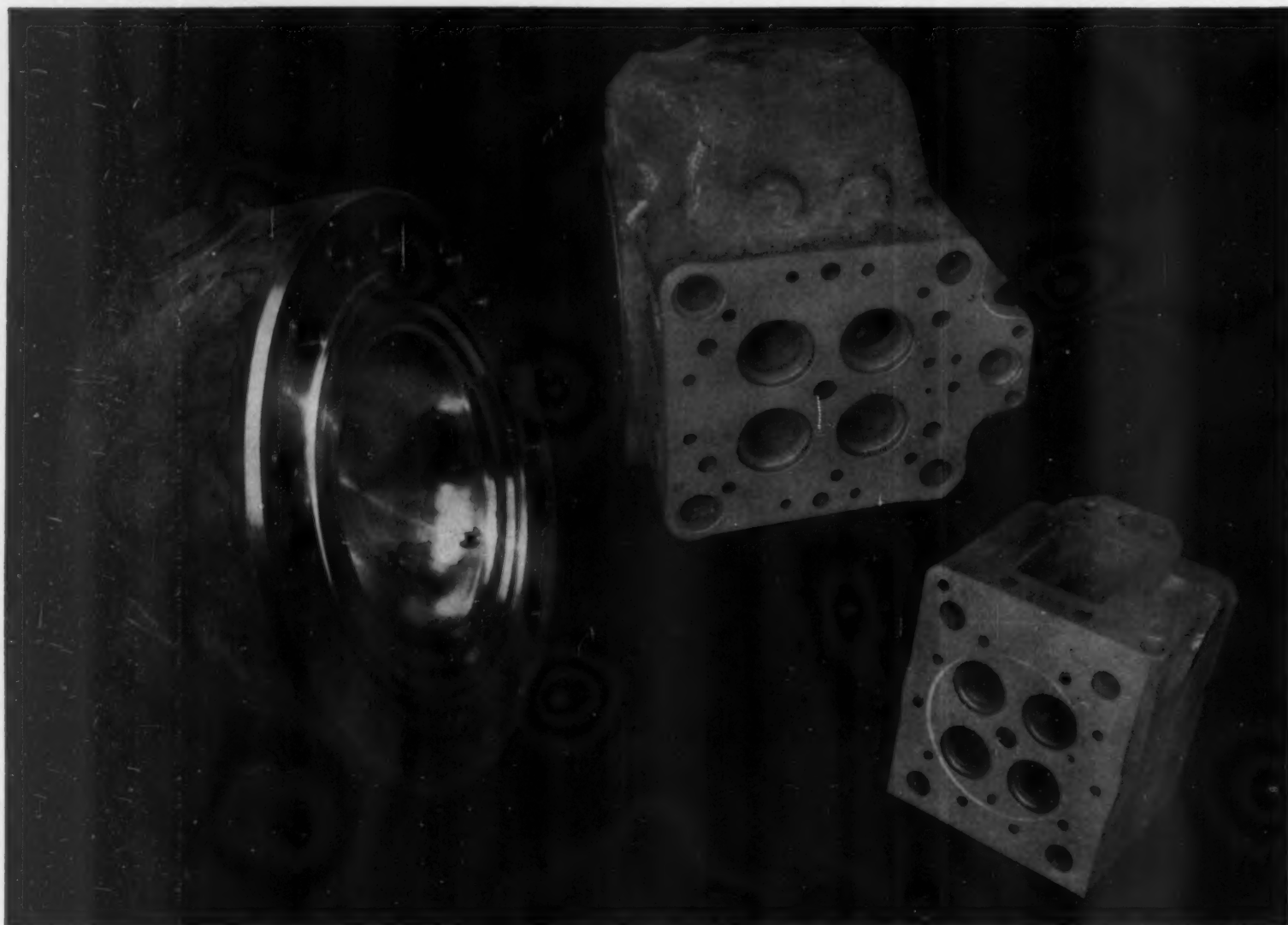
INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.



INTERNATIONAL

POWER THAT PAYS

LARGE or SMALL...VALVES or NO VALVES...2 or 4-CYCLE



DIESEL ENGINES WITH CAST ALUMINUM CYLINDER HEADS GIVE LONGER LIFE!

Leading manufacturers of diesel engines *specify* cast aluminum cylinder heads.

Why aluminum?

Aluminum's high thermal conductivity keeps exhaust valves cooler... lowers thermal stresses... offers freedom from scale formation... gives cylinder heads longer trouble-free operation. The 60% weight savings effected by aluminum eases the job of pulling heads. Aluminum's ability to handle greater heat loads gives an added safety factor.

Today these castings are fabricated in Alcoa's own foundries. If you are a diesel engine manufacturer, get in touch with Alcoa for a complete run-down

of all applications of aluminum. If you're a user of diesel power, look to aluminum for longer trouble-free operation. For a complete run-down on all of Alcoa's many facilities, write or wire: Aluminum Company of America, 1987-D Alcoa Building, Pittsburgh 19, Pennsylvania.

Alcoa 
Aluminum

ALUMINUM COMPANY OF AMERICA



Sign of good lubrication for Diesel locomotives *

Here's why Gulf Dieselmotive Oil cuts maintenance costs for railway Diesels, keeps engines clean:

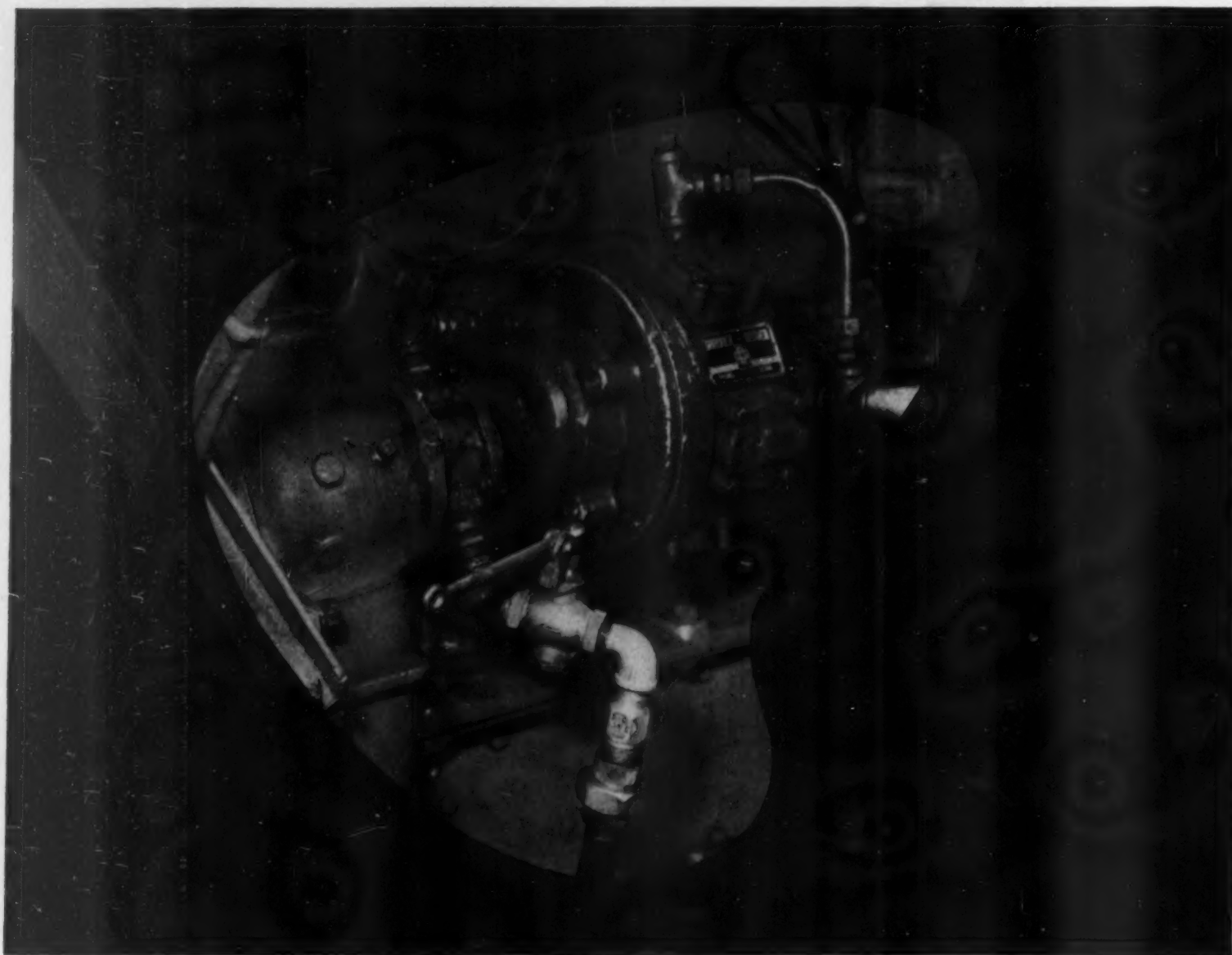
1. Effective detergent action fights piston ring belt deposits
2. High stability retards sludging
3. Base stock quality and refining methods prevent hard deposits on piston crowns.

For additional information on this quality oil, call in a Gulf Sales Engineer. Write, wire, or phone your nearest Gulf office today.

* This is a reproduction of durable decal which Gulf makes available to railroads that use Gulf Dieselmotive Oil in their Diesel locomotives.



Gulf Oil Corporation • Gulf Refining Company
Pittsburgh 30, Pa.



POWERFUL

GARDNER-DENVER AIR STARTER

...takes a gentle hold

Pinion engages ring gear at low speed —
saves strain and wear on gears.

...gives a fast turnover

Full cranking power develops automatically —
assures fast, smooth diesel engine starting.

Send for Bulletin AM-1.

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS





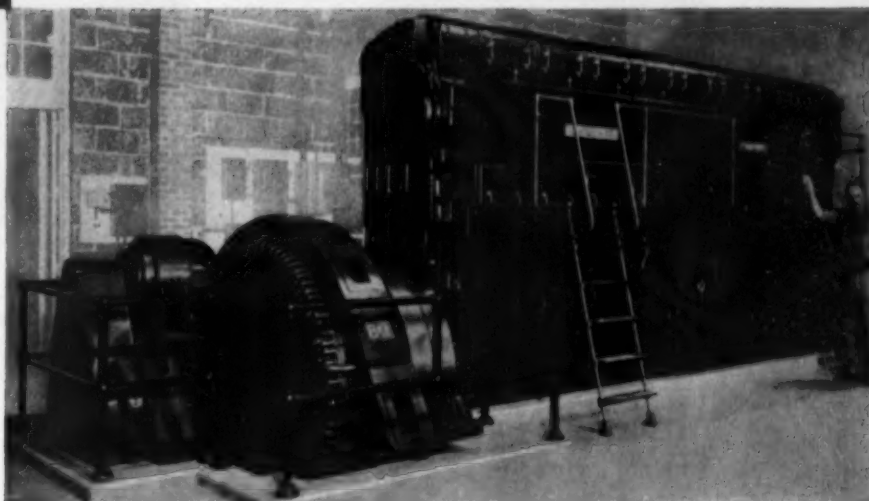
Superior DIESEL

"accomplished better results than the manufacturer ever promised"—L.W. MARPLE,

Superintendent of Woodsfield, Ohio, Power Plant

The Superior Diesel was installed at Woodsfield in 1950 so Mr. Marple's complete statement regarding the community's experience is further evidence of his satisfaction with the engine's performance—

"This SUPERIOR engine is doing a wonderful job since installation and has cost us nothing for maintenance. It has accomplished better results than National Supply ever promised and I would highly recommend this type of Diesel to any prospective buyer."



Model "80" Superior Dual-Fuel Diesel driving 600 KW generator.

There was basis for comparison, too, in view of the fact that Woodsfield has operated its own power plant since 1920 and installed its first full diesel engine in 1935. Two semi-diesels were replaced with diesels in 1946 and 1947 and these three units develop a total of 635 KW.

With the installation of the Superior

Diesel the entire daytime load is carried by this engine while two of the former units carry the demand after 11 p.m. This has proved to be economical for Woodsfield because the dual-fuel Superior, operating on natural gas with 10% liquid fuel for pilot, *reduces the overall fuel cost by 30%* when compared with full diesel fuel operation of the original engines.

Throughout the U.S.A., and in most other parts of the world, you'll find similarly outstanding performance records being established by Superior and Atlas Diesels. Ask your Engine Division representative or write Springfield for descriptive bulletins and case histories which demonstrate the efficiency and dependability of Atlas and Superior Diesels.



ENGINE DIVISION

THE NATIONAL SUPPLY COMPANY

PLANT AND GENERAL OFFICES:

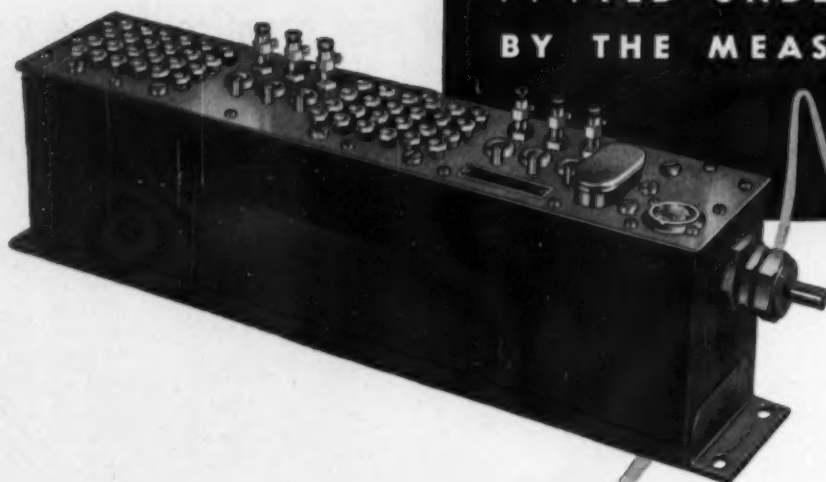
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MADISON-KIPP

Fresh Oil

FED UNDER PRESSURE
BY THE MEASURED DROP



**the most dependable
method of lubrication
ever developed!**

This lubricator becomes an integral part of a machine tool in which there are 48 vital bearings that require dependable lubrication. The

Madison-Kipp mechanism is so compact that the reservoir measurements are only 4" wide, 19 $\frac{3}{4}$ " long by 5 $\frac{3}{4}$ " high."

There are six different models to meet almost every application requirement. Please write us for all details regarding your particular lubricator requirements.

MADISON-KIPP CORPORATION
215 WAUBESA STREET • MADISON 10, WISCONSIN

kipp

• Skilled in Die Casting Mechanics • Experienced in Lubrication Engineering • Originators of Really High Speed Air Tools

4

reasons why Trane dry-type fluid coolers last longer

1

Correct metal selection

A wide variety of types of metals are available for highly corrosive applications. Coils can be supplied in combinations of cupro nickel, admiralty, red brass, copper, aluminum, monel, steel, stainless steel and many other special metals. TRANE engineered products have solved corrosion problems of all types, yet obtained maximum heat transfer and maximum life from the fluid circuit.

2

Permanently bonded fins

In constructing the Extended Surface Coil—heart of the fluid cooler—TRANE bonds fin to tube *mechanically*. This bond is as permanent as the metals that form it and as strong as though fin-and-tube were one. Heavy support plates are used to reinforce and protect the coil and prevent tube sagging. And the exclusive TRANE Guide Flange cradles the coil to permit expansion within casing.

3

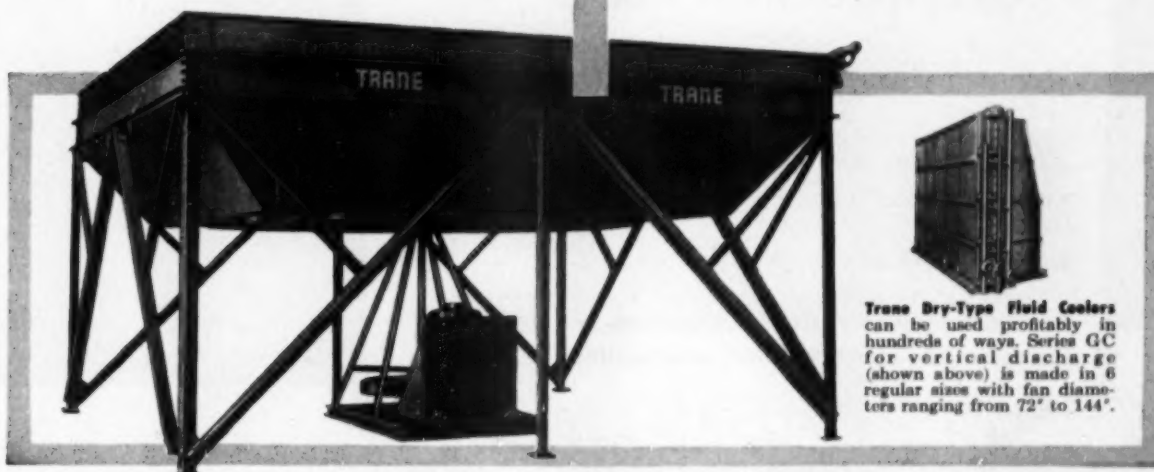
Extra-rugged construction

Framework of the TRANE Fluid Cooler is so strong it can be used for stationary or portable installation *without additional bracing*. Its simple structural design permits fastest possible erection. Yet it is more than strong enough to support core and accessories and withstand wind and shock load. Finish on the TRANE Fluid Cooler is a rubber-base paint that's completely weatherproof.

4

Freedom from vibration

TRANE Fluid Coolers run smoothly . . . quietly. They stay sound and tight longer because TRANE engineers have virtually eliminated the causes of vibration. Here's how: The variable-pitch fans are dynamically balanced. Solid, oversized fan shaft is firmly mounted in giant thrust bearings. Drive components are aligned at the factory and shipped assembled. Orifice ring is designed to *match* the fan.



Jacket water cooling costs are cut to the minimum with the TRANE horizontal air stream Fluid Cooler. Series EC—available in 14 sizes with fan diameters from 18" to 120".

TRANE pioneers in the science
of heat exchange

The Trane Company, La Crosse, Wis. • East. Mfg. Div., Scranton, Penn.
Trane Co. of Canada, Ltd., Toronto • 80 U.S. and 14 Canadian Offices

MANUFACTURING ENGINEERS OF HEATING, VENTILATING, AIR CONDITIONING AND HEAT TRANSFER EQUIPMENT

CHROME

gives unequalled resistance to

HEAT, FRICTION, CORROSION, ABRASION

in the new

Sealed Power

Chrome-Faced

Cyclan

Compression Ring

—plus all these famous Cyclan advantages:

- High tensile strength alloy iron machined to Sealed Power's exacting specifications
- Extreme resistance to property changes under operating conditions
- High impact value for shock resistance
- High resistance to breakage plus ability to undergo considerable distortion prior to fracture without sacrificing resilience
- A structure that assures excellent wear qualities

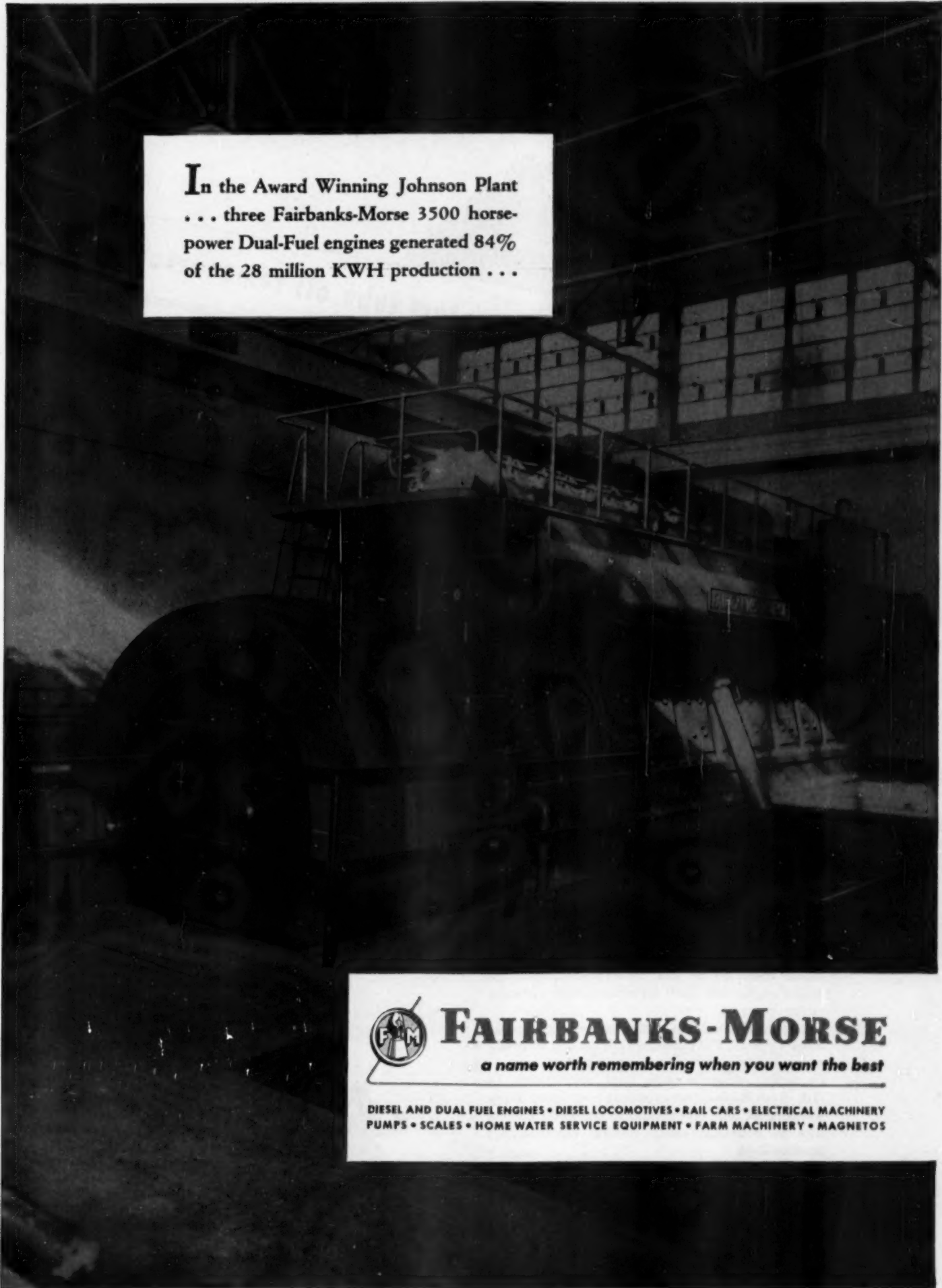


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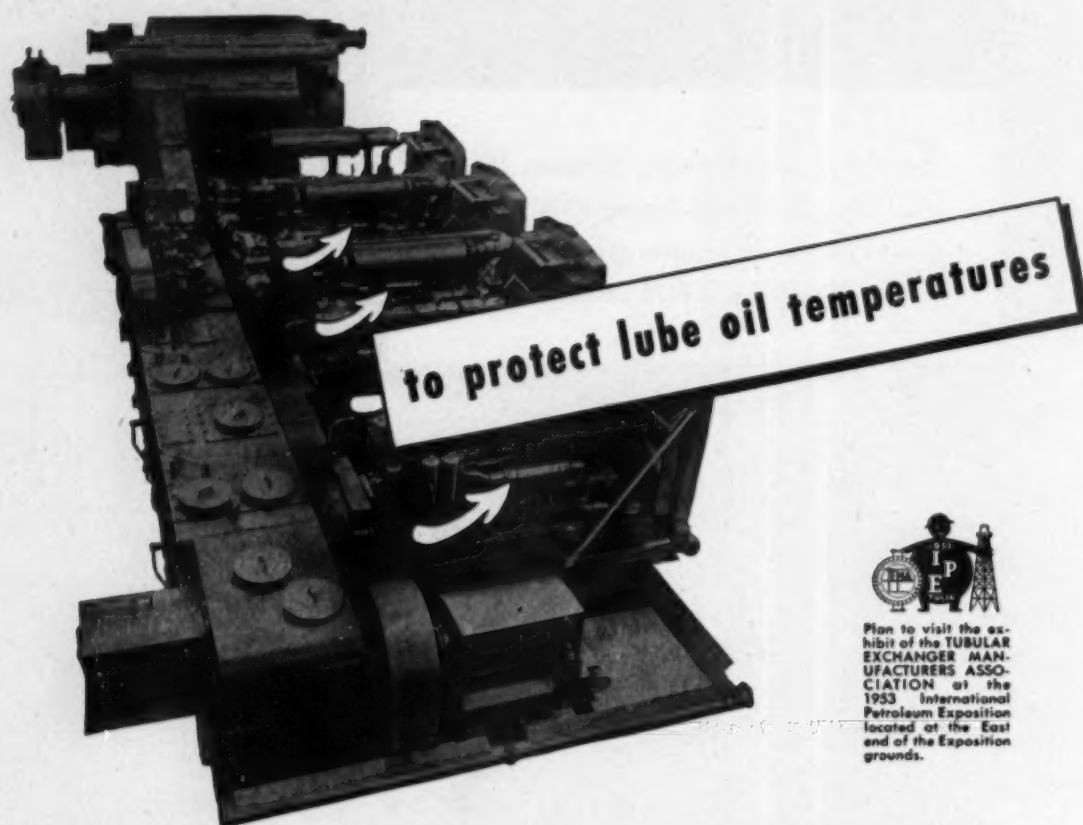
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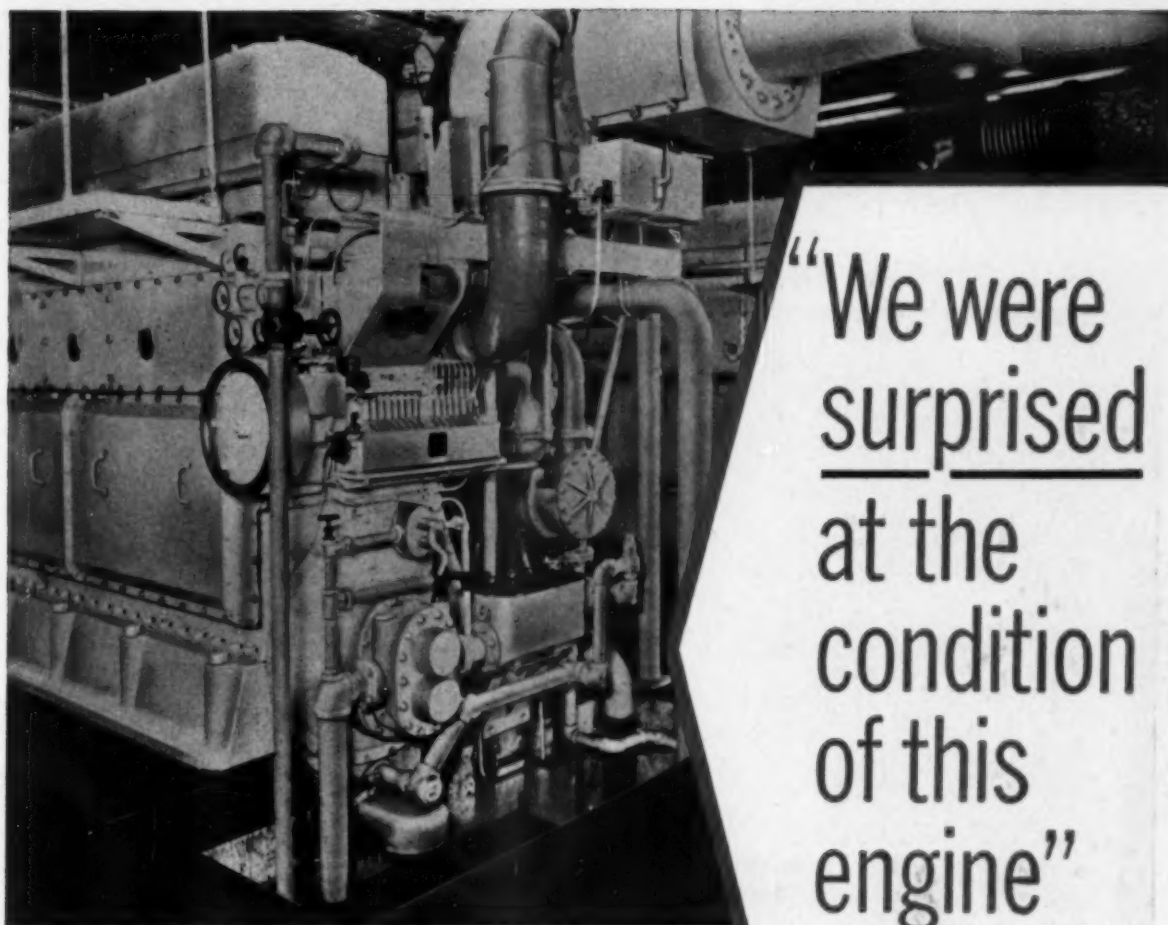
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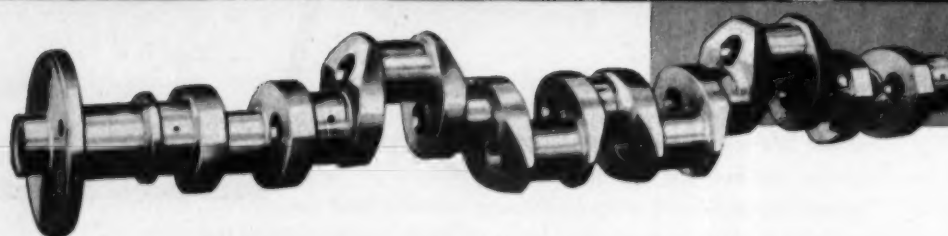
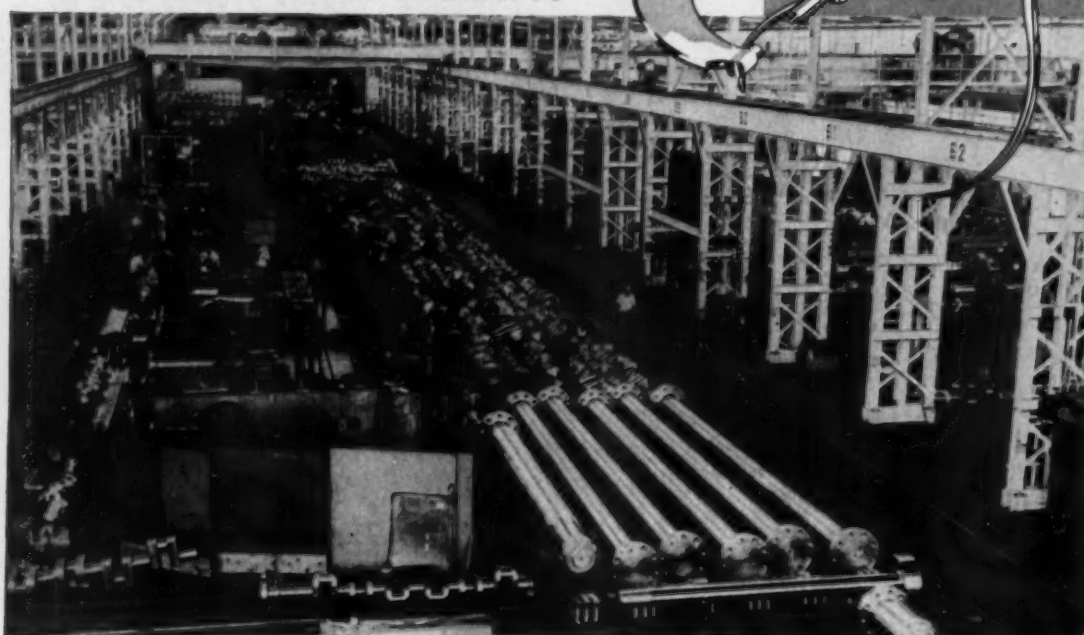
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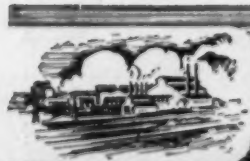
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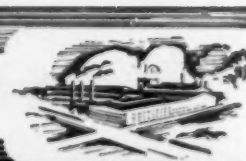
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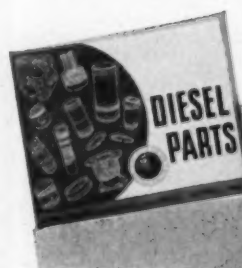
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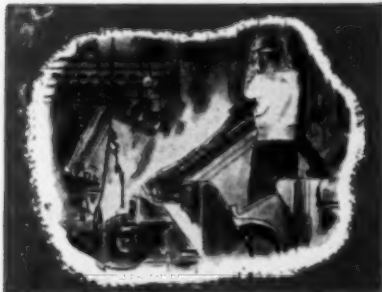
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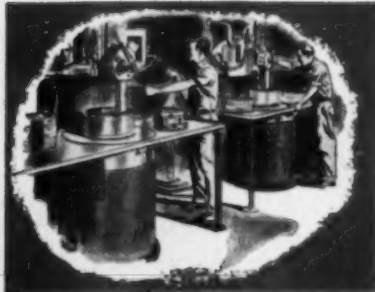
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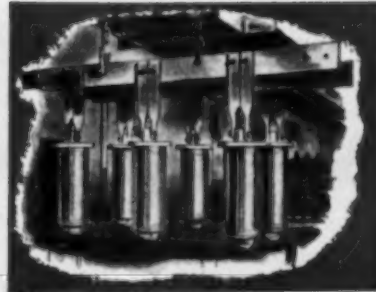
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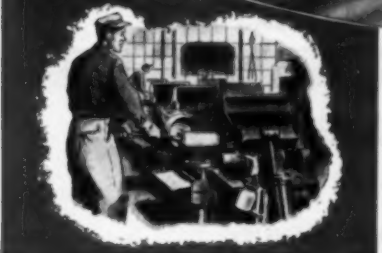
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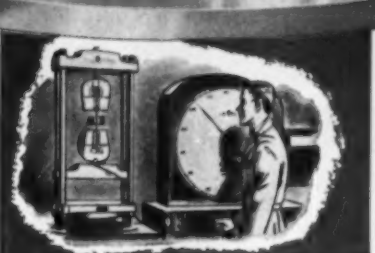
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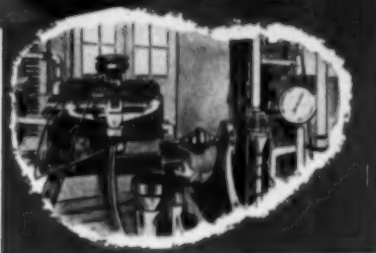
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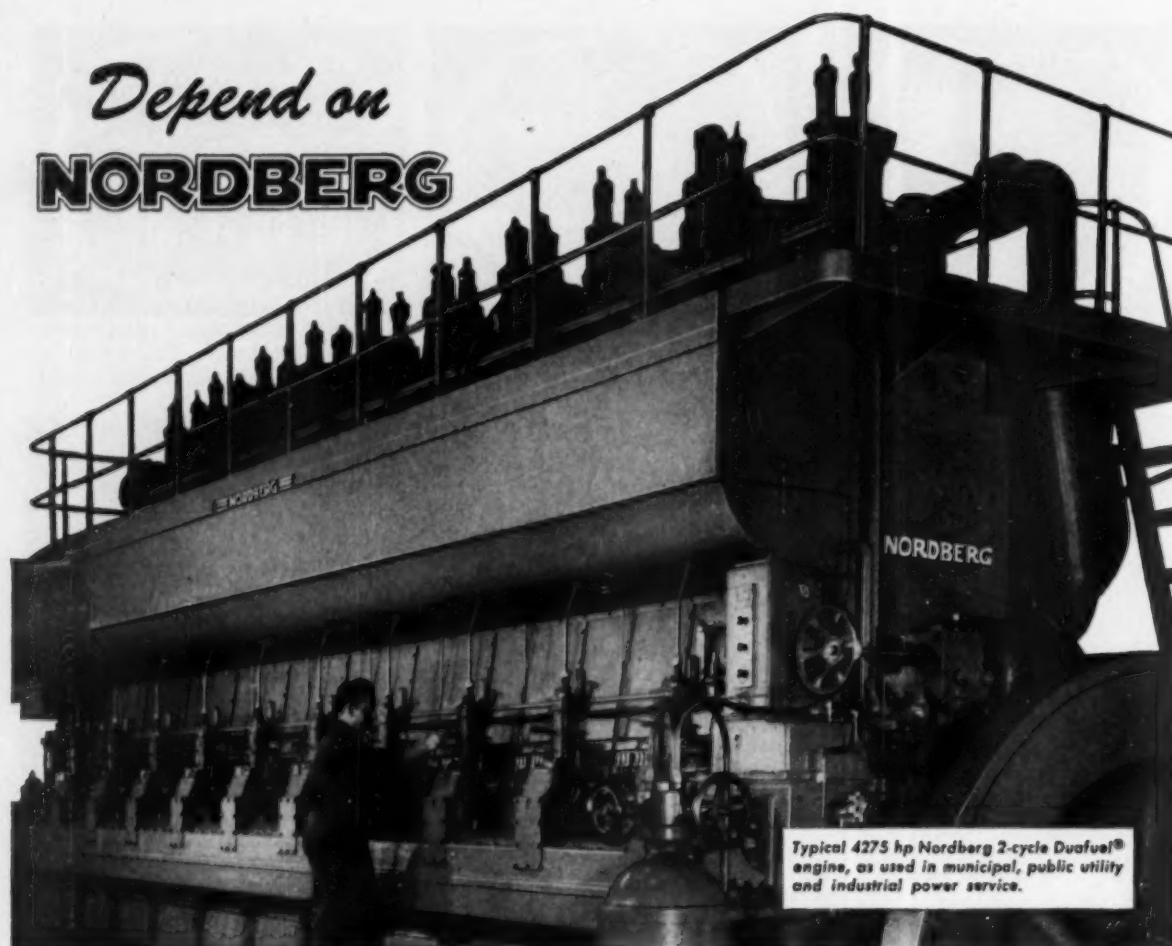
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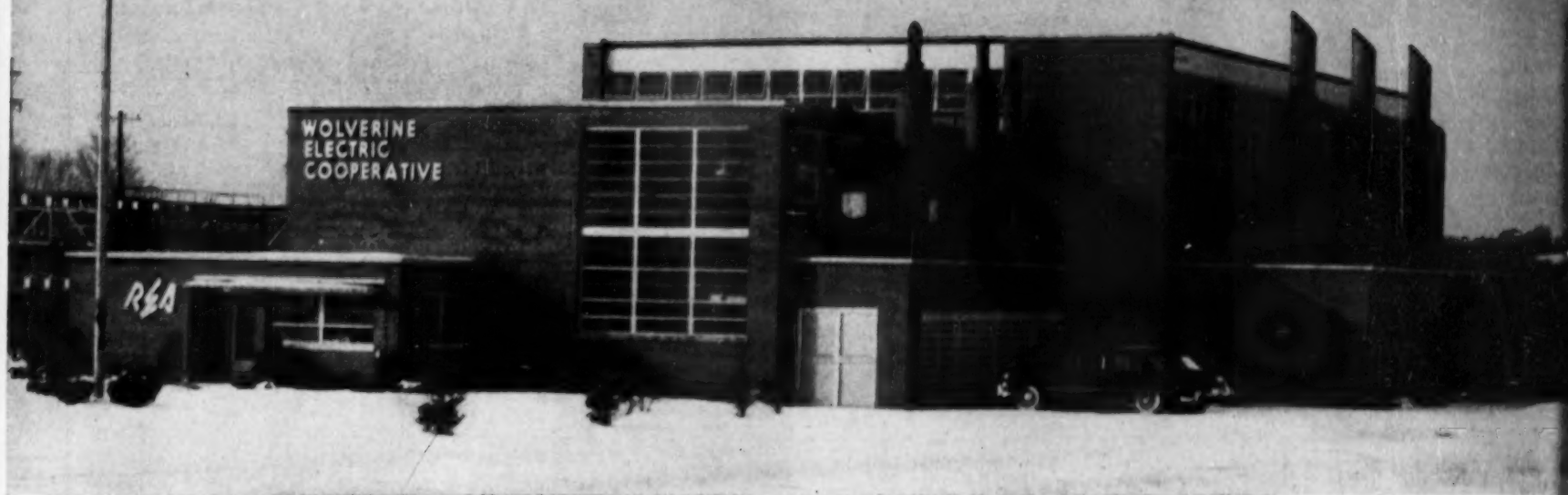
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JOHNSON PLANT OF WOLVERINE COOPERATIVE WINS ANNUAL DIESEL PROGRESS AWARD

THE Wolverine Electric Cooperative's Johnson Plant at Hersey, Michigan, has won the DIESEL PROGRESS award as the most efficient REA generating station in the nation in 1952. The award is given to the plant which produces a kilowatt-hour most economically. To insure that the plant will be credited for operating efficiency rather than the availability of cheap fuel, the cost of fuel for all plants is equalized at 50 cents per 1,000,000 btu.

The top plants are selected by the Rural Electrification Administration on the basis of official operating reports submitted to Washington by all REA cooperatives. After the fuel cost adjustment is made, the plant which achieved the lowest operating cost per kwh. is certified as the winner. DIESEL PROGRESS awards to this plant a bronze

plaque attesting to its position as the year's most efficient REA generating station.

A visit to the Wolverine headquarters at Big Rapids, Mich., and to the plant at Hersey makes it clear that the success of the Johnson plant is the direct result of sound plant design, efficient generating equipment, proper operating methods, and meticulous attention to every significant detail in plant operation. This cooperative, which supplies power to three distribution cooperatives in the State of Michigan is managed by efficient, experienced Denis L. Ryan. He is ably assisted by John Keen, Assistant Manager, who exercises close supervision over plant operations. At the Johnson plant, Chief Operator Germaine Lockwood heads a 6-man staff which obviously takes pride in the plant, its appearance and, most important, in the efficiency

of its dieselized power generating equipment.

DIESEL PROGRESS wishes to extend its congratulations to the officers and directors of the Wolverine Electric Cooperative: Carl Johnson, President; Harry Burmeister, Vice-President; Leonard Balgoyan, Secretary-Treasurer, and Directors Eugene Ten Brink, Glen Chase and I. E. Royer; to the operating officials of the Cooperative; Manager Denis L. Ryan, Assistant Manager John Keen, Superintendent of Transmission S. Donald King and Office Manager Edward H. Servis; and to the operating staff of the Johnson Plant: Chief Operator Germaine Lockwood, Maintenance Operator Delbert Roggow, Operators Elwood Mitchell, Roy Ritzmann and Vernon Mitchell, and Apprentice Operator James Gillett. A list of the five top REA plants for 1952 appears at the end of this article.

THE STORY OF THE WINNING PLANT

Winner of Efficiency Award, Michigan Cooperative Predicts Further Improvement in Operation of Three Fairbanks-Morse and Three Cooper-Bessemer

By DENIS L. RYAN*

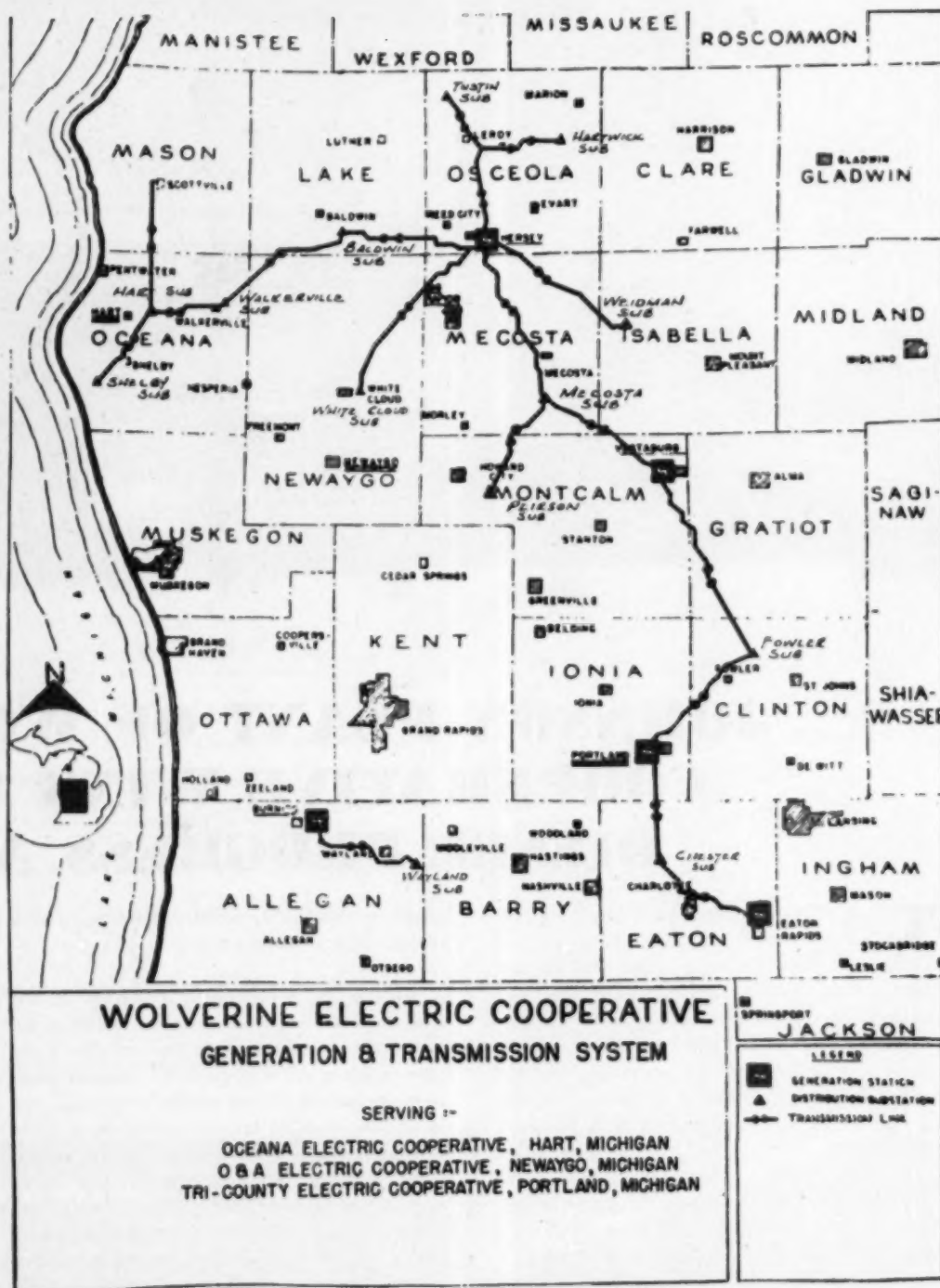
RATED as the most efficient REA generating station in the nation in 1952, the Johnson Plant at Hersey, Michigan, is the key production center of the Wolverine Electric Cooperative which supplies power for three distribution cooperatives serving nearly a third of the State of Michigan. Wolverine operates five generating stations with 22 diesel and dual-fuel engines, delivering electricity over 333.8 miles of high-voltage transmission lines to 15 substations.

It was no farther back than 1949 that the Tri-County Electric Cooperative of Portland, Mich., the O & A Electric Cooperative of Newaygo, Mich., and the Oceana Electric Cooperative of Hart, Mich., formed Wolverine Electric in an effort to integrate their generating and transmission systems in order to improve service and achieve greater operating efficiency. Now, just four years later, the success of this program has been attested by national recognition for economical operation. The Johnson plant, which carries the bulk of the system load, has been certified on the basis of official reports to REA to receive the DIESEL PROGRESS AWARD as "the most efficiently operated of all REA internal combustion plants" in 1952. The prime movers which helped earn this distinction are: three identical 3,500-hp. Fairbanks-Morse dual-fuel engines, two 1010-hp. and one 1,650-hp. Cooper-Bessemer dual-fuel engines.

The Johnson Plant had its inception in 1946 when the O & A Co-op, sought to meet demand in the Hersey area by putting up a Quonset hut and installing a Model JS-8-T supercharged Cooper-Bessemer diesel rated at 1,010 hp. at 400 rpm. Operation of the unit began in February and at the same time work was started on a permanent building adjoining the hut. In December, 1946, a second 1,010 hp. C-B diesel was put on the line in the new building and, the following February, the first unit was moved over from the hut. In February 1949, the Cooperative installed a third Cooper-Bessemer supercharged engine, a Model LS8-GDT rated at 1,650 hp. at 327 rpm. Natural gas had become available in 1948 and all three units were operated as dual-fuel engines.

With the formation of Wolverine Electric later in 1949, it was decided to undertake a major expansion of the Johnson Plant and make it the base producer of the integrated system. A large new

*Manager, Wolverine Electric Cooperative.



Map showing the areas serviced by Wolverine Electric Cooperative generation and transmission system. The Johnson plant at Hersey, Michigan is the key production center of the Cooperative which supplies power for three distribution cooperatives covering nearly a third of the state of Michigan.

brick, block and steel section was added to the building and three new engines were purchased: 10-cylinder, two-cycle, Model 31AD18 Fairbanks-Morse dual-fuel engines, of 18-in. bore and 27-in. stroke, each rated at 3,500 hp. at 277 rpm. The first of the big engines went into service in October 1951, the second in December 1951, and the third in February 1952. This brought plant capacity to 14,170 hp.

In the year 1952, the plant produced a gross generation of 28,873,210 kwh. Fuel consumption for the year included 259,784,600 cu. ft. of natural gas and 223,924 gal. of fuel oil, an average of 9.00 cu. ft. of gas and 0.0077 gal. of oil per kwh. With a heating value of 972 btu. per cu. ft. of gas and 138,532 btu. per gal. of oil, this represented an average of 9,815 btu. per kwh. for the year. Average operating engine load was under three-quarters of rated capacity.

Table I gives detailed figures of generation and fuel consumption for each of the six engines in the plant. It should be noted that the figures for No. 6 engine and for the entire plant include 153,000 kwh. produced by the newest engine wholly on oil immediately after installation in February. The engine was then switched to the more economical dual-fuel operation. The big No. 5 unit had the greatest output, 8,680,700 kwh. and consumed just 8.83 cu. ft. of gas and 0.0063 gal. of pilot oil per kwh. for the low average of 9,455 btu. per kwh.

Selection of the Johnson plant as top REA internal combustion station was based on production cost per net kwh. with fuel costs adjusted so that all plants calculate on the basis of 50 cents per million btu. The actual production cost at Johnson, with fuel gas at 37 cents per 1,000 cu. ft. and fuel oil at 9.7 cents a gal., totaled \$166,453.91, including supervision and engineering, station labor, fuel, lubricating oil, supplies, and all maintenance. With net generation at 27,932,460 kwh., the average production cost per net kwh. was 5.96 mills. Table II gives not only the detailed production costs but also such overhead items as depreciation, taxes, interest, insurance and other administrative and general expenses.

Securing natural gas for the Johnson plant was something of a problem since the Cooperatives have been unable to arrange the purchase of transmission line gas from the utility serving Michigan. Intent on cutting fuel costs, the Co-ops encouraged a local refining company to develop two small gas fields, one at East Paris five miles from the Hersey plant and the other at West Paris seven miles from the plant. Wolverine contracts for the total production of the fields and the plant's own line picks up the gas at the intersection of the gathering system of the six wells. Actually, Wolverine contracted for the output of the East Paris field before the wells were drilled.

Gas reaches the plant at a line pressure of 200 psi., passed through a heater and a regulator and enters a 10-in. header in the plant at 55 psi. From the header, the gas goes to each engine through individual admission valve, regulator and meter. At



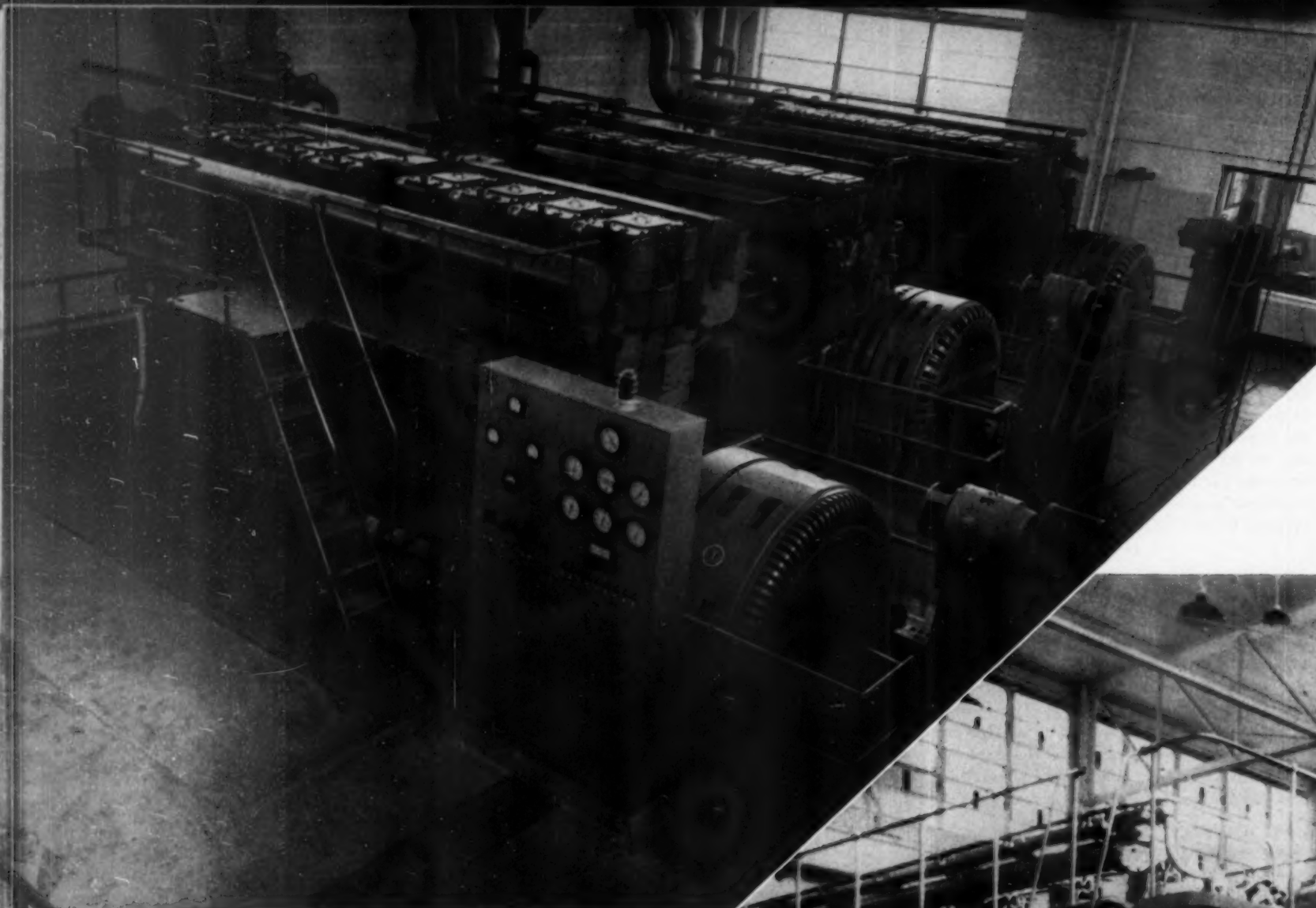
Wolverine Electric Cooperative Board of Directors and Manager, (l. to r.) Denis L. Ryan, Manager; Harry Burmeister, Vice President; Glen Chasz, Director; Carl Johnson, President; Leonard Balgoyan, Secretary-Treasurer; I. E. Royer, Director; and Eugene Ten Brink, Director. Above: Manager Ryan discusses with Assistant Manager Keen the efficiency of the dual-fuel engines at Wolverine's Johnson plant.

the engines, pressure is 35 psi. for the Fairbanks-Morse units and 20.6 psi. for the Cooper-Bessemer.

All engines switch automatically to fuel oil if gas pressure fails and gas supply is shut off if either lube or pilot fuel pressure fails. The pilot oil used is a blend of 70 percent gas oil and 30 percent No. 3 oil. The oil is stored in two 20,000 and two 30,000 gal. tanks and is transferred through waste-packed,

multi-element filters to day tanks in the plant basement. The motor-driven transfer pumps are float controlled and the day tanks are equipped with high and low level alarms. Separate supply pumps send fuel from the day tanks through meters to the engine injection systems.

Wolverine's operating engineers are highly conscious of fuel economy and exercise particular care



The original engines in the plant are these three Cooper-Bessemer dual-fuel units, one 1650 hp., model LS-8-GDT and two 1010 hp., model JS-8-T. All with Ideal generators. The Kirkhoff gauge board with Westinghouse gauges and Alnor pyrometer serves all three engines. Young radiators are located under the silencers and air filters in building annex.

L. to r., front row: Elwood Mitchell, Operator; Germaine Lockwood, Chief Operator; Roy Ritzmann, Operator; Vernon Mitchell, Operator; back row: James Gillett, Apprentice Operator; Delbert Roggow, Maintenance Operator.

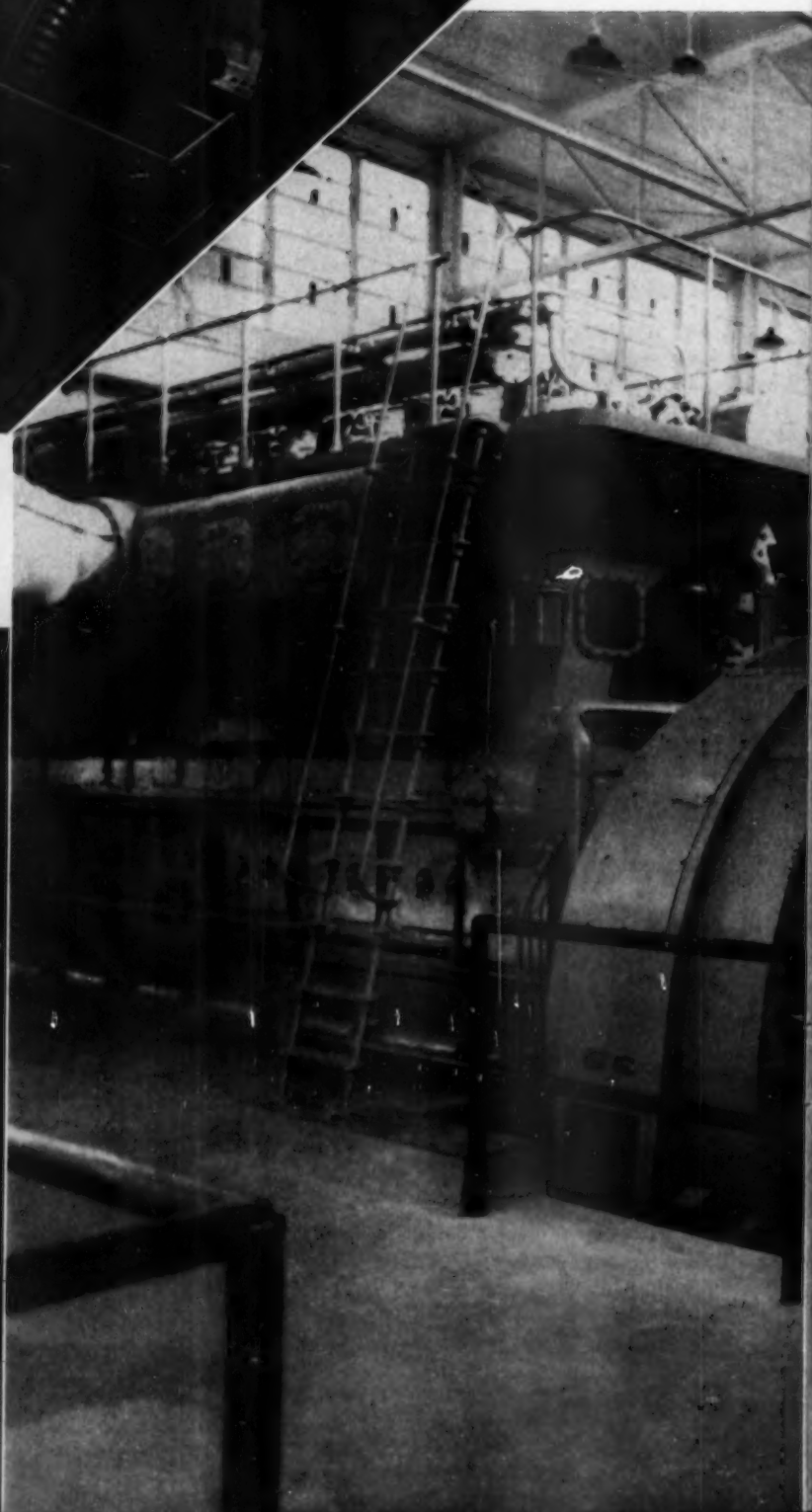


TABLE I—OPERATING DATA JOHNSON PLANT, 1952

	Eng. #1 1010-hp.	Eng. #2 1010-hp.	Eng. #3 1650-hp.	Eng. #4 3500-hp.	Eng. #5 3500-hp.	Eng. #6 3500-hp.	Total Plant
Kwh. Gen.....	1,246,210	1,009,700	2,382,100	8,027,400	8,680,700	7,527,000	28,873,210
MCF Gas	10,959.4	9,275.5	20,325.0	75,363.3	76,679.0	67,182.4	259,784.6
Gal. Fuel Oil	13,756	12,534	22,792	58,080	54,829	61,933	233,924
Cu.Ft. Gas/Kwh.	8.79	9.18	8.53	9.38	8.83	8.92	9.00
Gal. Oil/Kwh.0110	.0124	.0095	.0072	.0063	.0082	.0077
Btu./Kwh.	10,068	10,641	9,607	10,114	9,455	9,806	9,815
Fuel Cost Mills/Kwh.	4.32	4.59	4.07	4.16	3.88	4.09	4.08
Eng. Hrs.	2,231	1,875	2,974	4,182	4,387	4,352	

*All figures for the No. 6 engine include production of 153,000 kwh. as straight diesel with consumption of 11,769 gal. of fuel oil.

This view of the three 3500 hp. F-M units shows the duplex Nugent fuel filters, the Madison-Kipp cylinder lubricators and the three individual gauge boards.



in maintenance of fuel injection equipment. The new section of the Johnson plant has a separate closed room for nozzle and injection pump maintenance with a nozzle tester and precision-type centerless grinder. Nozzles are replaced immediately if fuel oil consumption rises and are switched for servicing anyway every 30 days. The nozzles are tested, cleaned and returned to service. If they do not meet exacting standards, they are dismantled and the needle valve ground and then hand-lapped.

The detergent-type lubricating oil used throughout the plant is purchased in tank-car lots at a saving of 6 cents a gal. and stored in two 4,000-gal. tanks. Lube oil is transferred by a motor-driven pump to a 2,000-gal. tank in the plant basement and then is pumped as necessary through individual meters to each engine sump.

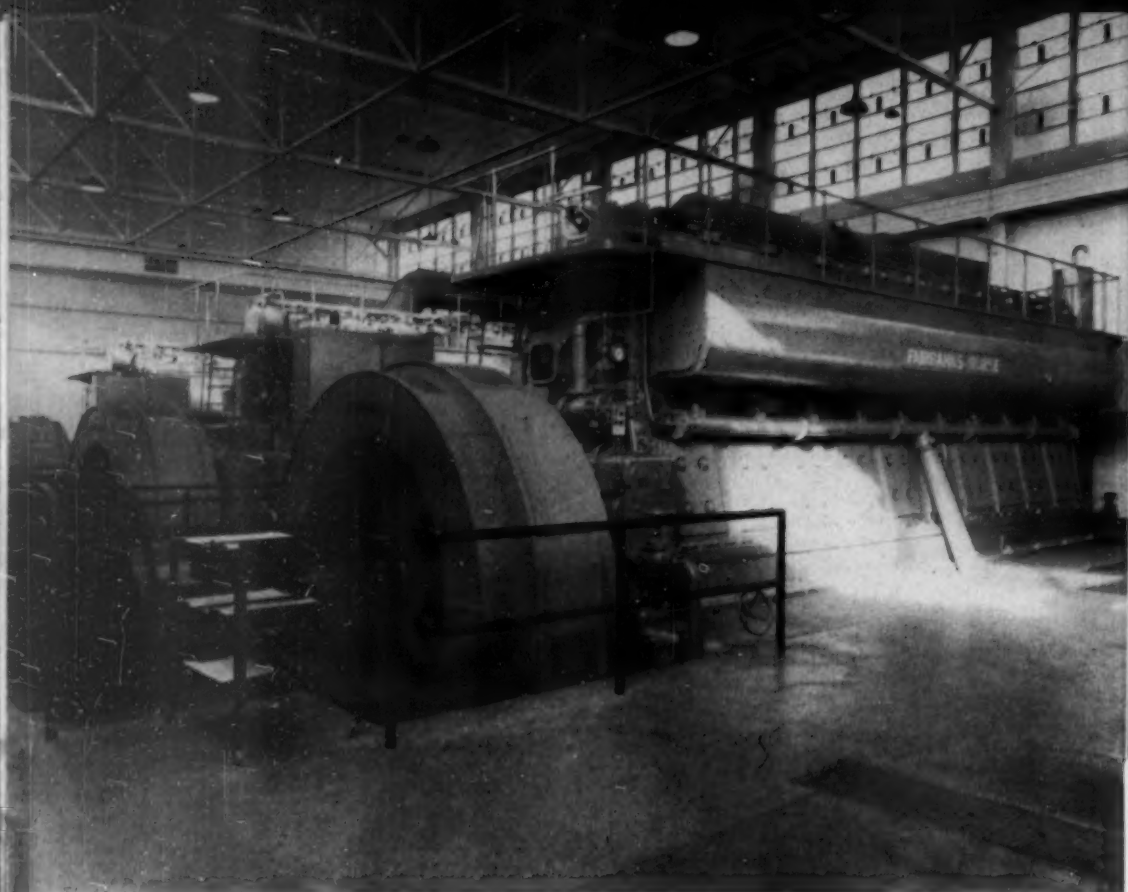
**TABLE II—JOHNSON PLANT, 1952
COST COMPUTATION OF NET
ENERGY GENERATED**

Expense Items	Total Dollars	Mills per kwh.
Operation, Supervision & Engineering	\$ 1,652.43	0.06
Station Labor	23,160.28	0.83
Fuel, Oil	21,863.34	0.78
Fuel, Gas	95,128.90	3.41
Lubricating Oil	12,583.77	0.45
Other Oper. Exp. & Sup.	3,317.37	0.12
Maintenance	8,747.93	0.31
Total Production Cost	\$166,453.91	5.96
Overhead Costs		
Depreciation	\$ 53,772.56	
Taxes	7,096.30	
Interest	29,526.52	
Insurance	2,373.42	
Other Admin. & General ..	7,489.19	
Total Overhead Costs	\$100,258.05	3.59
Total Production Cost	\$266,711.96	9.55

Every effort is made to maintain lube oil in perfect operating condition. Lube oil from each engine's pressure system is bypassed through an individual cellulose-packed filter and returned to the sump.

The oil is tested regularly to detect contamination and dilution. When necessary, it is pumped into a 2,000-gal. dirty oil tank and processed in a reclaimer which has heating elements to drive off dilution and waste packed filters to remove contaminants. The oil is kept at SAE 40 and some SAE 30 oil is added to replace light ends driven off in use and reclamation. Lube condition has been excellent and, on the filters serving the three newest engines, it has not yet been necessary to change elements. Each engine has an oil cooler with thermostatic bypass valve to keep lube at prescribed temperature. Also, each unit has a motor-driven auxiliary lube pump for use in starting and shutting down the engine.

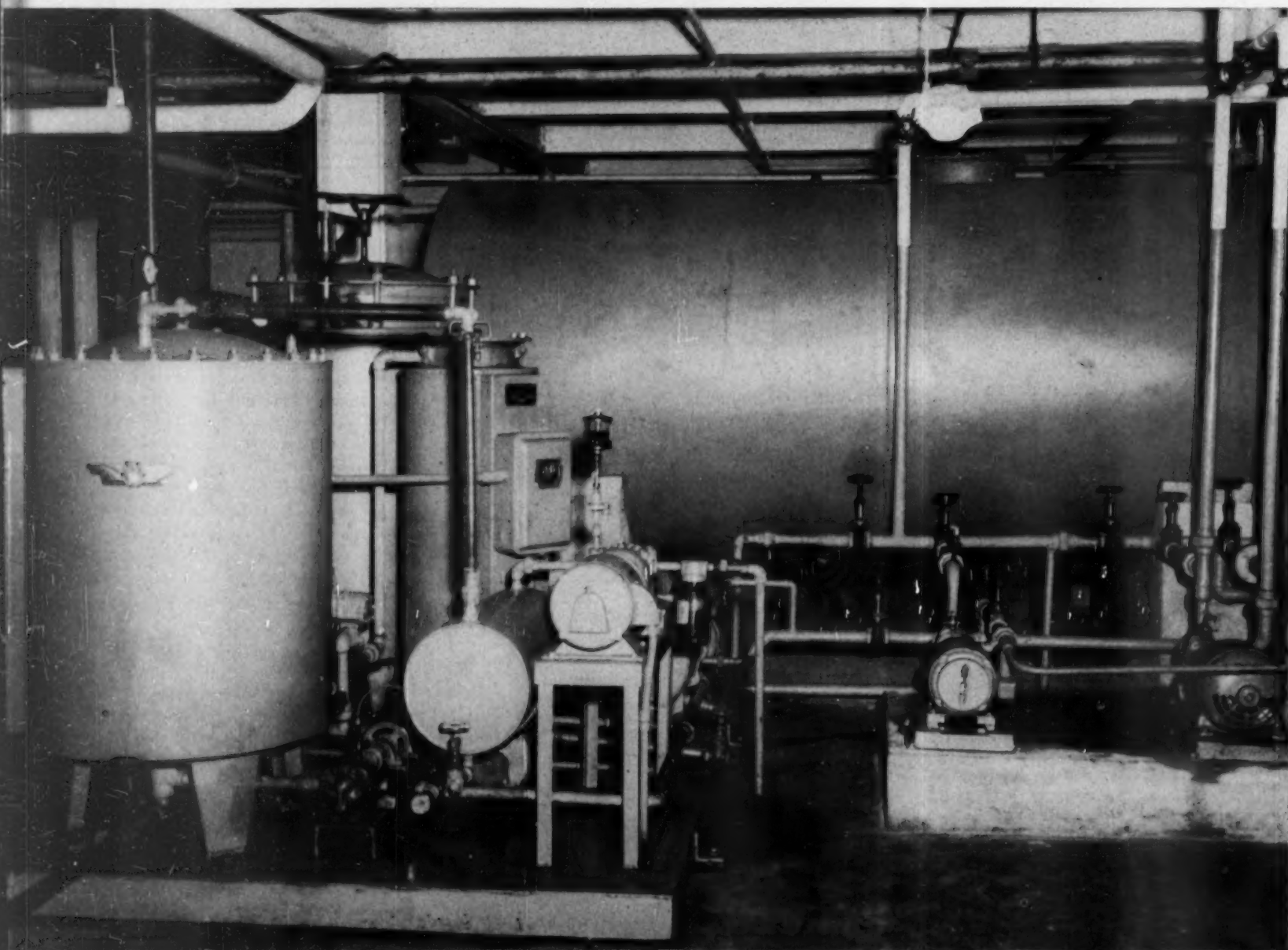
The main lube circuits of the big engines include not only full-flow strainers but also magnetic filters to remove any metal particles that might get into the oil. Jacket water for the original engines in the plant is cooled in radiators by motor-driven fans but the big engines make use of the inexhaustible raw water supply of the nearby Muskegon River. A pump house was constructed on the river bank

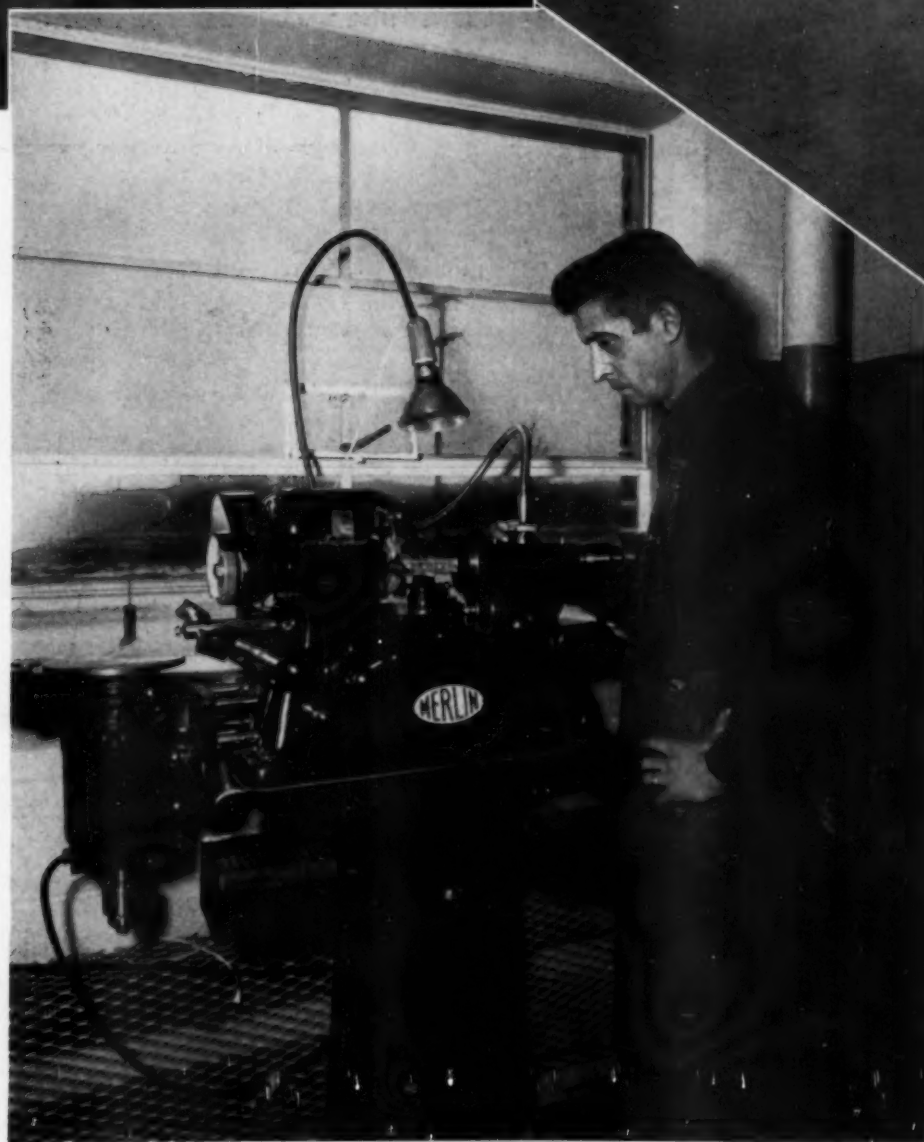
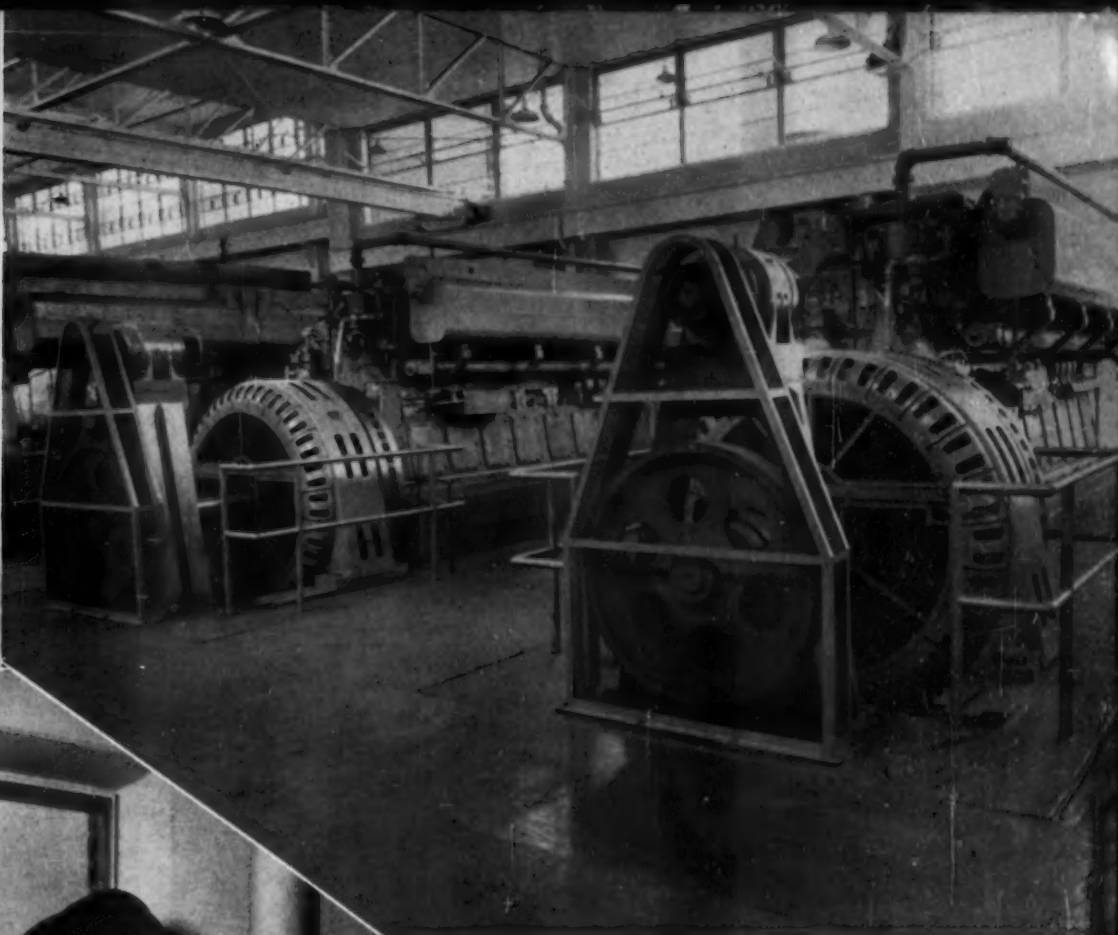
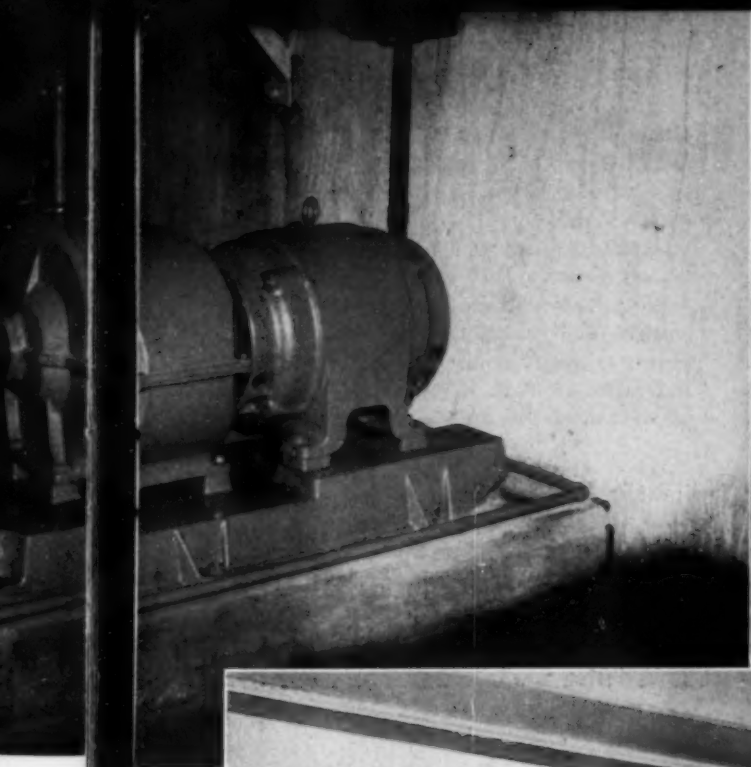


Each F-M engine is served by a Blackmer auxiliary lube pump.

Major power producers are these three model 31AD18 Fairbanks-Morse dual-fuel engines, each rated at 3500 hp. at 277 rpm. Each engine drives a Fairbanks-Morse alternator. Also visible is the Woodward governor.

The Hoffman oil reclaimer at left is used for batch purification of lubricating oil, supplementing the individual filters for each engine. At right, are the Viking lube transfer pumps, and in the background is one of the lube storage tanks.

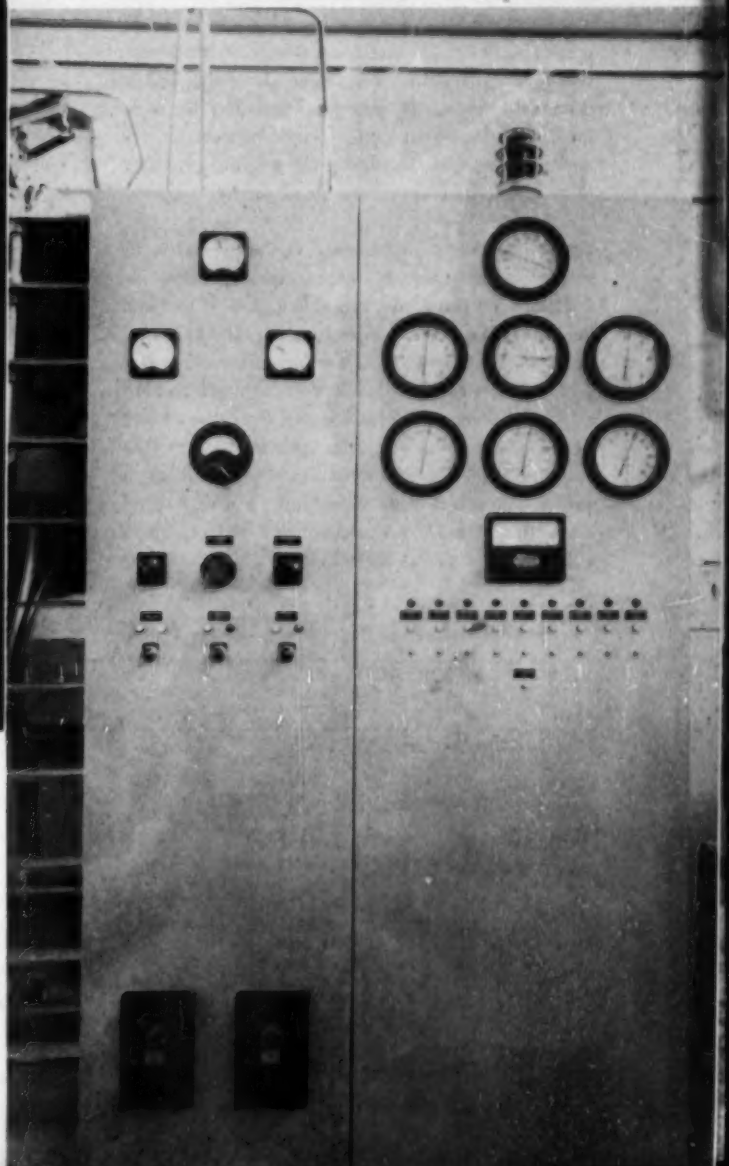




Maintenance Operator, Delbert Roggow, services fuel injection nozzle needle on a Merlin grinder. ➡

Each of the 3500 hp. engines has a Kirkhoff gauge board which holds Westinghouse gauges, an Alnor exhaust pyrometer, a Liquidometer day tank level gauge, and controls for accessory equipment including the auxiliary exciter. ➡

The original engines in the plant are these three Cooper-Bessemer dual-fuel units, one 1650 hp., model LS-8-GDT and two 1010 hp., model JS-8-T. All with Ideal generators. The Kirkhoff gauge board with Westinghouse gauges and Alnor pyrometer serves all three engines. ➡



to house three 750 gpm. centrifugal pumps driven by 25 hp. electric motors and one 400 gpm. centrifugal driven by a 15 hp. motor. Water is drawn from the river through a traveling screen and pumped to the heat exchangers and oil coolers at the plant, returning then to the river. Each engine has a motor-driven centrifugal pump to circulate soft water through engine jackets and individual heat exchangers with thermostatically-controlled bypass valve. Makeup water is treated in a softener before addition to the jacket supply.

Scavenging air for the Fairbanks-Morse two-cycle engines is drawn through automatic self-cleaning filters into air chambers of ample proportions which house the blowers. Each blower is driven by a 250-hp. induction motor powered directly at 4160 volts from the generator of the engine served. A 1-kw. direct-current generator driven by a 2-hp. motor is used to force the field of the alternator when the engine is started, providing a quick surge of current to accelerate the blower. Use of ample filters and a large suction chamber has resulted in less than normal restriction of air flow and, in consequence, the blower load is smaller than anticipated. From the blowers, the air passes through aftercoolers into the intake header. Actually, the aftercoolers have not yet been in service at this writing since the motor-driven water pumps which will serve them are just in process of installation.

Air for the four-cycle Cooper-Bessemer is drawn through filters and supplied to the engines under some pressure by exhaust-driven turbochargers. Exhaust gases from all engines vent through vertical snubbers. Beside each of the big engines is a gauge and alarm panel which includes alarms on jacket water and lube temperature and pressure, day tank level, an exhaust pyrometer, and controls for accessory equipment including the auxiliary exciter. One such panel serves the three smaller engines.

Operating policy emphasizes vigilance and conservative preventive maintenance. Crankcase inspections are conducted monthly and close check is kept on compression, lube consumption and fuel economy. As long as these are satisfactory, it is not felt necessary to pull pistons. Only as much is done as proves necessary to track down the cause of any performance deficiency. One operator has primary responsibility for maintenance. Operation of a power plant is a team operation in which many must share credit for success; the Cooperative's officers and directors for sound planning and pol-

icy, Assistant Manager John Keen for supervision of plant design, construction and operation, and Chief Operator Germaine Lockwood and his staff for sound, skillful, vigilant operating.

For several reasons Wolverine expects to improve both the efficiency and economy of operations at Johnson in 1953. Personnel is becoming more familiar with the big engines. Use of the aftercoolers should improve efficiency. Rising demand may permit improved load factor. The price of natural gas

will drop to 33 cents in mid-year. With production at 28 million kwh. a year, the Johnson plant is scarcely flexing its muscles. It is expected that production at this plant will be built to 6 million kwh. a month with present equipment, then increase the load on the other plants. Nor has Johnson finished growing. There is room in the building for another big unit and the building was designed for further extension. Economy of the modern dual-fuel engine is such that it is reasonable to consider an eventual plant as large as 30,000 hp.

List of Equipment

Engines—Three 10-cylinder, two-cycle, 3500-hp., Model 31AD18, dual-fuel engines of 18-in. bore and 27-in. stroke operating at 277 rpm. Fairbanks, Morse & Co. Two 1010-hp., Model JS-8-T, dual-fuel engines. Cooper-Bessemer Corp. One 1650-hp., Model LS-8-GDT, dual-fuel engine. Cooper-Bessemer Corp.

Alternators—Three on F-M engines, Fairbanks, Morse & Co. Three on C-B engines. Ideal Electric & Mfg. Co.

Governors—Woodward Governor Co.

Blowers—Roots-Connersville Blower driven by Fairbanks, Morse & Co. motors.

Turbochargers—Elliott Buchi.

Radiators—On Cooper-Bessemer. Young.

Motor-Generator sets—Fairbanks, Morse.

Air filters—On F-M engines. Continental Self-cleaning. On C-B engines. Air Maze.

Jacket water pumps—On F-M engines. Fairbanks, Morse. On C-B. Allis-Chalmers.

Raw water pumps—On F-M engines, Fairbanks, Morse.

Water softener—Bruner Corp.

Raw water screen—On F-M engines. Link Belt.

Jacket water thermostatic valve—On F-M. Powers.

Heat exchangers—On F-M. Ross. On 1650-hp. C-B. Alco.

Lube oil—Texaco Ursa Two Star.

Cylinder lubricators—On F-M. Madison-Kipp.

Aux. lube pump—On F-M. Blackmer.

Lube screens—On F-M. Air Maze.

Lube by-pass filters—On F-M. U. S. Hoffman.

Lube filters—On C-B. Cuno. Briggs Filtration Co. Hilco. The Hilliard Corp.

Lube reclaimers—U. S. Hoffman.

Lube coolers—On F-M. Ross. On C-B. Ross. Alco.

Lube meters—On F-M. Buffalo.

Lube test kit—Gerin.

Lube transfer pumps—Viking Pump Co.

Fuel oil—Oceola Refining Co.

Fuel transfer pumps—On F-M. Fairbanks, Morse. On C-B. Roper.

Fuel filters—On F-M. U. S. Hoffman. Nugent.

Day tank level pump control—On F-M. General Controls.

Day tank level alarms—On F-M. Minneapolis-Honeywell.

Day tank level gauges—On F-M. Rochester Mfg Co. Liquidometer Corp.

Fuel meters—On F-M. Buffalo.

Gas heater—On F-M. Brown, Sivals & Bryson.

Gas regulators—On F-M. McAleer. Fisher.

Gas valves—On F-M. Luckenheimer.

Gas meters—On F-M. Roots-Connersville. On C-B. Emco. Rockwell.

Exhaust pyrometers—Alnor.

Gauges—Westinghouse.

Thermometers—On F-M. DPS.

Starting air compressors—Quincy Compressor Co. Ingersoll-Rand Co. Cooper-Bessemer Corp.

Exhaust snubbers—Burgess Manning Co.

Crane—On F-M. Manning, Maxwell & Moore. On C-B. Shaw.

Switchboard—Kirkhoff Electric Co.

Switchboard instruments—Westinghouse.

Battery—Exide.

Injection nozzle grinder—Merlin.

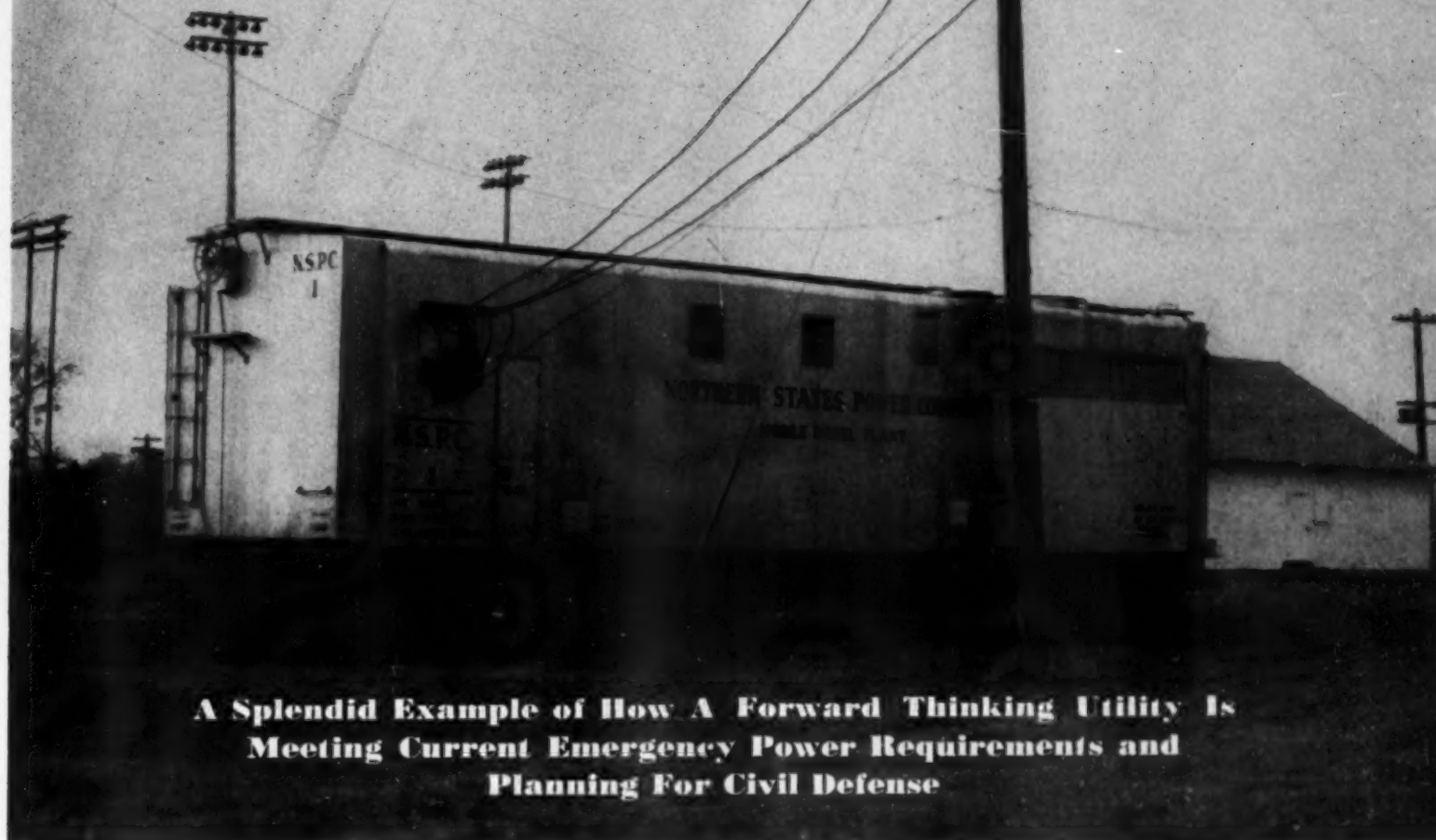
Nozzle tester—Fairbanks, Morse.

Consulting engineers—J & G. Daverman, Grand Rapids, Mich.

THE FIVE TOP REA PLANTS FOR 1952

No.	Plant	Net Kwh.	Fuel Cost ¢/mm Btu	Annual Fuel Cost	Adjusted Fuel Cost (Base 50¢/mm Btu.)	Difference in Fuel Cost	Annual Production Expense	Adjusted Production Expense	Mills/Net Kwh. Adjusted	Make of Engines
1.	Michigan 46 Newaygo Wolverine Electric Coop. Hersey Plant.....	27,932,458	41.21	\$116,992.00	\$141,946.00	+\$24,954.00	\$166,453.91	\$191,408.00	6.85	3—Fairbanks Morse 3—Cooper Bessemer
2.	Missouri 60 Ripley M&A Electric Power Coop. Green Forest Plant.....	24,708,900	28.17	76,318.15	135,459.95	+59,141.80	117,825.17	176,966.97	7.16	3—Cooper Bessemer
3.	Minnesota 98 Pope Western Minnesota Power Coop. Benson Plant.....	13,992,000	72.65	103,417.93	71,175.00	—32,243.00	133,000.00	100,757.00	7.20	5—Cooper Bessemer
4.	Michigan 37 Huron Thumb Electric Coop. of Michigan Caro Plant.....	11,580,700	69.08	81,574.25	59,043.30	—22,530.95	111,807.36	89,276.41	7.71	3—Cooper Bessemer
5.	Oklahoma 32 Comanche Western Farmers Electric Coop. Woodward Plant.....	13,408,400	17.40	25,238.32	72,523.90	+47,285.60	56,577.38	103,862.98	7.75	4—Nordberg

WE NEED A THOUSAND OF THESE CARS



A Splendid Example of How A Forward Thinking Utility Is Meeting Current Emergency Power Requirements and Planning For Civil Defense

Northern States Power Company's mobile diesel plant No. 1 is shown at Mayville, No. Dakota, hooked to the local lines and ready for emergency service.

MOBILE DIESEL PLANT MEETS UTILITY NEEDS

Northern States Power Co. Uses Compact Self-Sufficient Units Mounted in Rail Cars for Emergency Service, Peaking to Facilitate Line Repairs

WHEN a substation must be repaired or rebuilt, or when a transmission line is broken in a driving Dakota snow storm, Northern States Power Company is in an excellent position to maintain service to its customers because of a pair of mobile power plants which can ride the rails to the point of need. These generating stations on wheels perform a variety of services in the big utility system. They are employed to feed electricity into local lines when repair work is in progress on substations or transmission lines. They are stationed at strategic locations when winter sets in to guard against service interruptions caused by storm. They can be moved to meet emergencies that develop. Finally, they sometimes are called on to join the major generating facilities in the system in carrying peak loads.

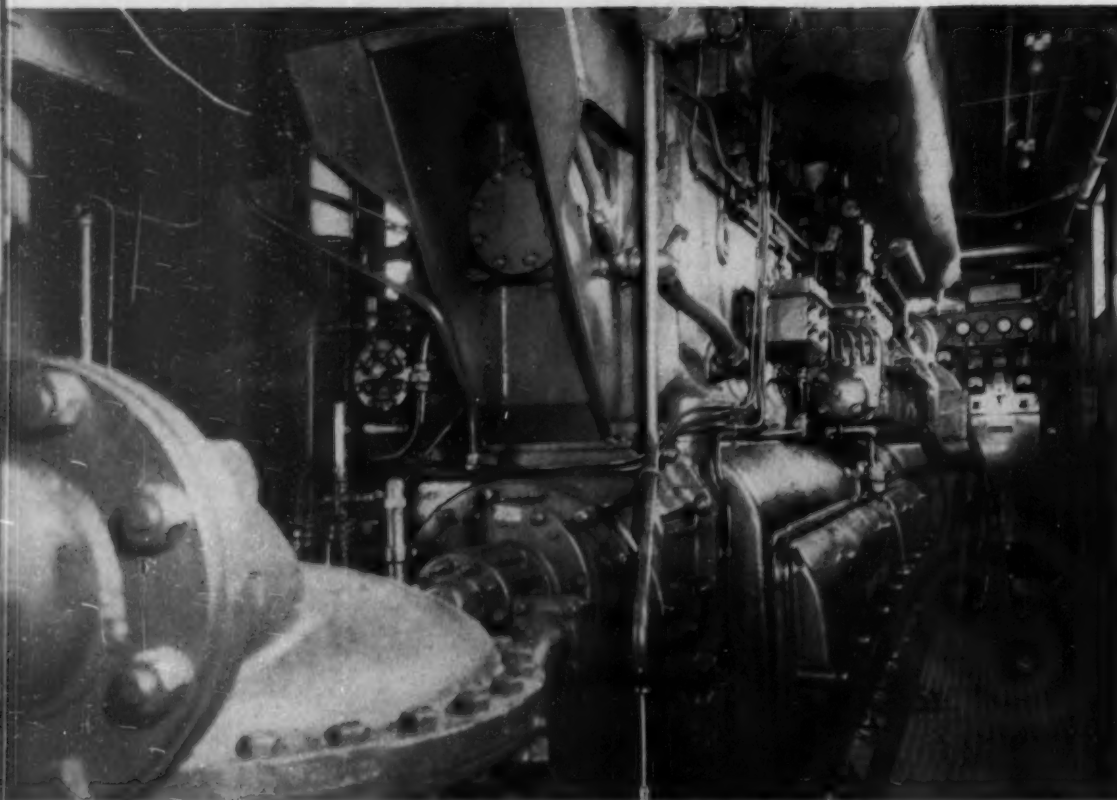
Mobile Unit No. 1 was first put into service in December, 1946, at Mayville, N. D. This is one of the strategic locations at which Northern States likes to have a standby unit available for service. In accordance with regular practice, the car is run

Editor's Note: As a nation we need a thousand mobile emergency generating sets like this, built by the Public Utilities, operated and maintained by the Public Utilities. Each unit exchangeable and loanable to adjoining Public Utilities, to meet catastrophic emergencies, whether they be local or national in effect. This program should be backed up with 500 to 1000 kw. emergency generating sets mounted on truck trailers. These latter units to reach off-railroad localities bereft of electric power.

onto a special siding where it can be hooked into the local electric distribution system. One section of the track is removed to protect the engine-generator units against damage by accidental collision with switching cars in the vicinity. It is a simple matter to replace the track when it is necessary to move the car. Heart of each unit is an 8-cylinder, 4-cycle, supercharged Alco diesel of 12½-in. bore and 13-in. stroke rated at 1080 horsepower at 600 rpm. (This is the same type and size engine which is operated in many of the company's stationary

plants at 720 rpm. to develop 1300 hp.) The diesel in the mobile unit drives directly a 950 kva., 760 kw., 3 phase, 60 cycle, 4160/2400 volt Elliott generator with 10 kw. belted exciter mounted on the generator frame to save space. This is a complete, fully self-sufficient power plant compressed into a space 10 feet wide, 14 feet 5 inches high and 41 feet long.

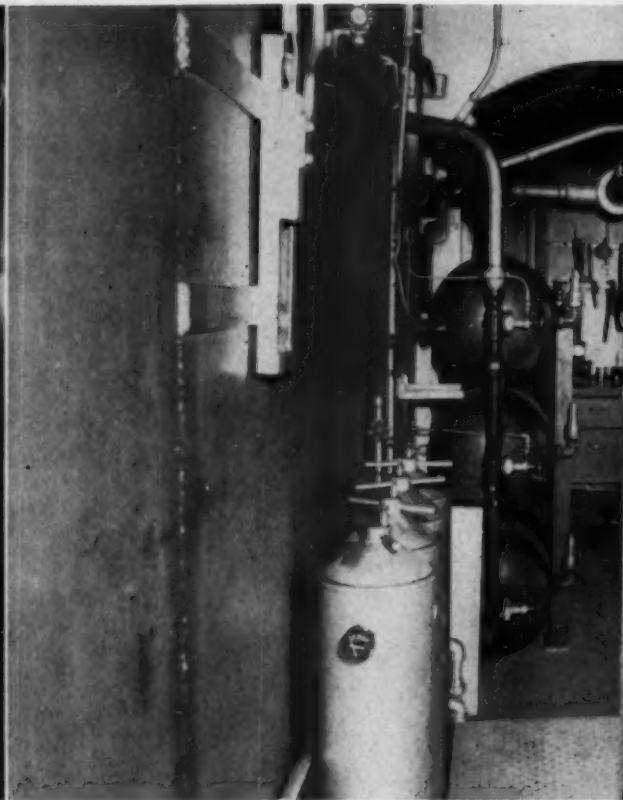
The diesel fuel is stored in a 1200-gallon tank built into the car at one end. During operation, the fuel is drawn from the tank and pumped through a filter to the engine fuel injection pumps by a supply pump on the engine. In addition, there is a motor-driven fuel booster pump. Lubricating oil is circulated through the diesel under pressure by a built-in, engine-driven pump. Included in the circuit is a shell-and-tube oil cooler. Part of the oil is drawn continuously from the pressure system and cleaned in an 8-element, cellulose-type filter. An engine-driven centrifugal pump circulates cooling water through the engine jackets and through a radiator in the roof of the car. The radiator fan is



The 1080 hp. Alco, 4-cycle, supercharged. This plant serves local areas during emergency, repair or rebuilding operations.

driven through right-angle reduction gears by a 40 hp. electric motor. Manually-controlled louvers help in regulating water temperature. Special measures are taken to insure that the diesel is always

warm and ready for swift calls to service. Engine cooling water is circulated continuously (when the diesel is not in operation) by a motor-driven centrifugal pump through an oil-fired heater. Keeping



Auxiliary equipment is grouped at one end of the car. At left are the Hilco lube filters, behind them the starting

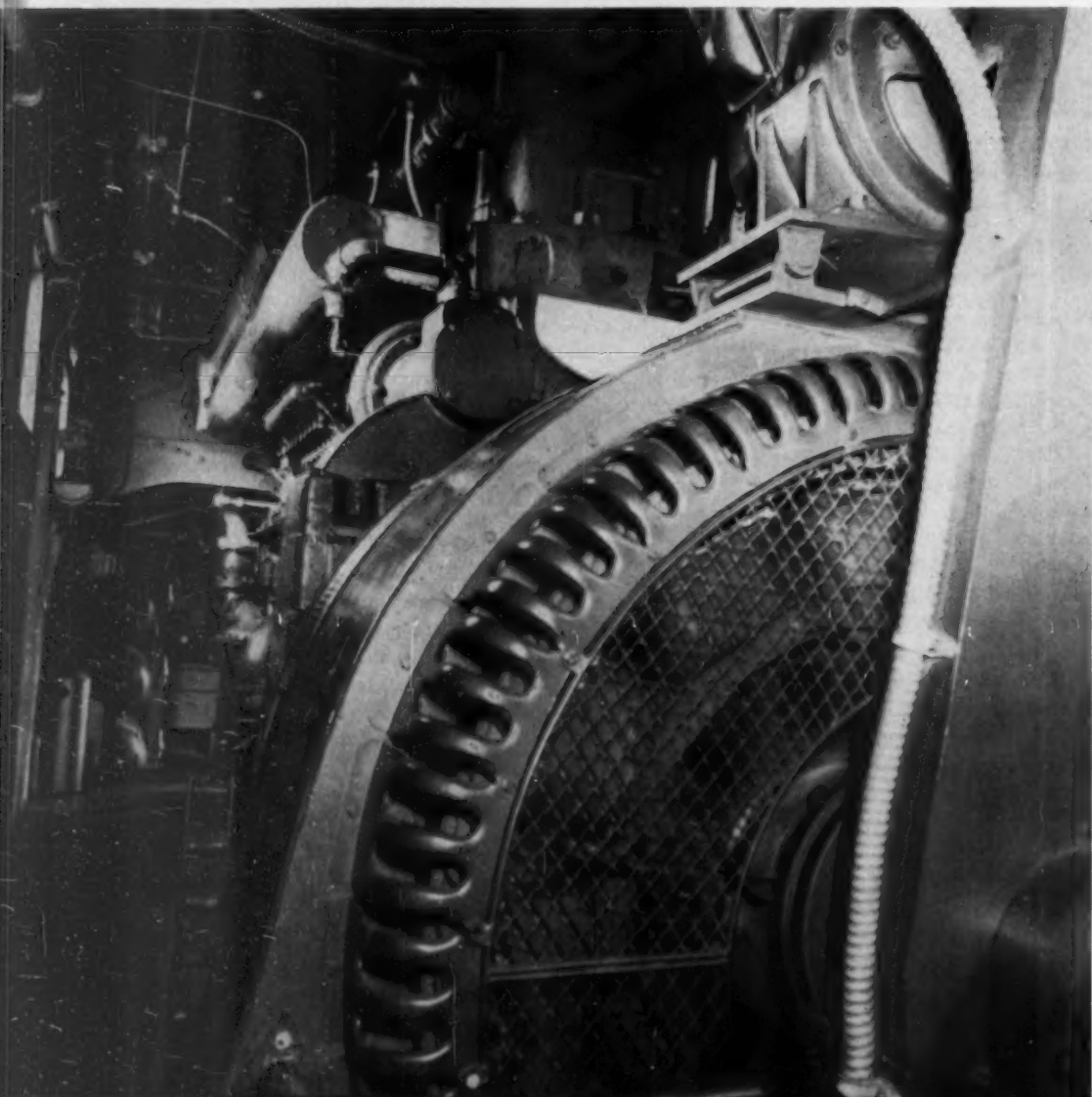
the engine warm all the time not only facilitates quick starting but tends to reduce cylinder and bearing wear.

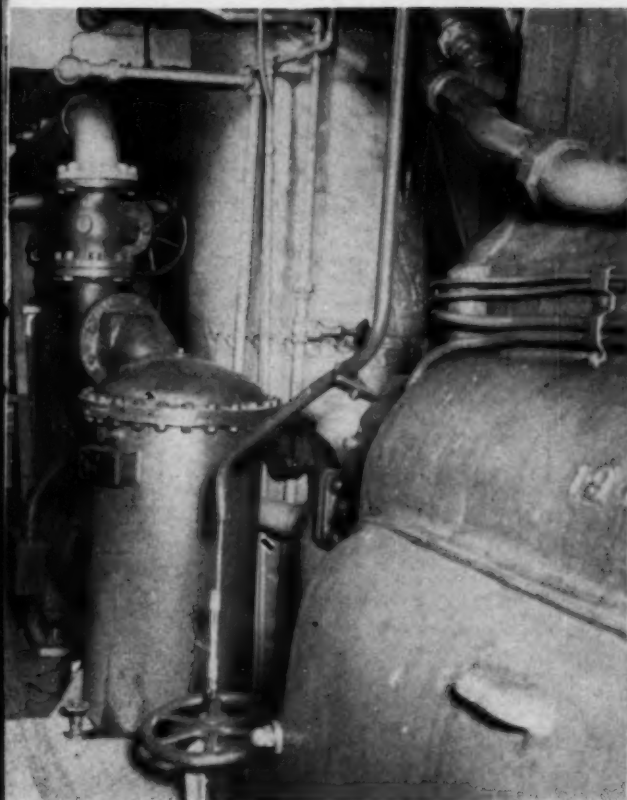
The diesel is started by compressed air supplied by a compressor which can be belted to either 5 hp. electric motor or to a small gasoline engine. Three air receivers are kept at 250 lb. pressure. Combustion air is drawn through louvers in the side of the car through viscous impingement-type filters to the exhaust-driven turbocharger which supplies the cylinders. Exhaust gases pass from the supercharger to an insulated vertical silencer inside the car and then vent through the roof. To provide electricity for lighting within the car and for the oil burner, there is a 3 kw., 115 volt gasoline engine-generator set.

A compact 2-panel switchboard at the generator end of the main engine holds a diactor regulator, synchroscope, ammeters, voltmeters, time over-current relays and totalizing kilowatt-hour meters as well as a multi-point exhaust pyrometer. The car is equipped with transformers so that it can bypass substations and permit their repair. The mobile power plant runs on standard railroad trucks but it is hardly a standard box car. There are double steel walls filled with mineral wool insulation material. The roof of the car can be opened to permit maintenance men to perform such jobs as pulling pistons.

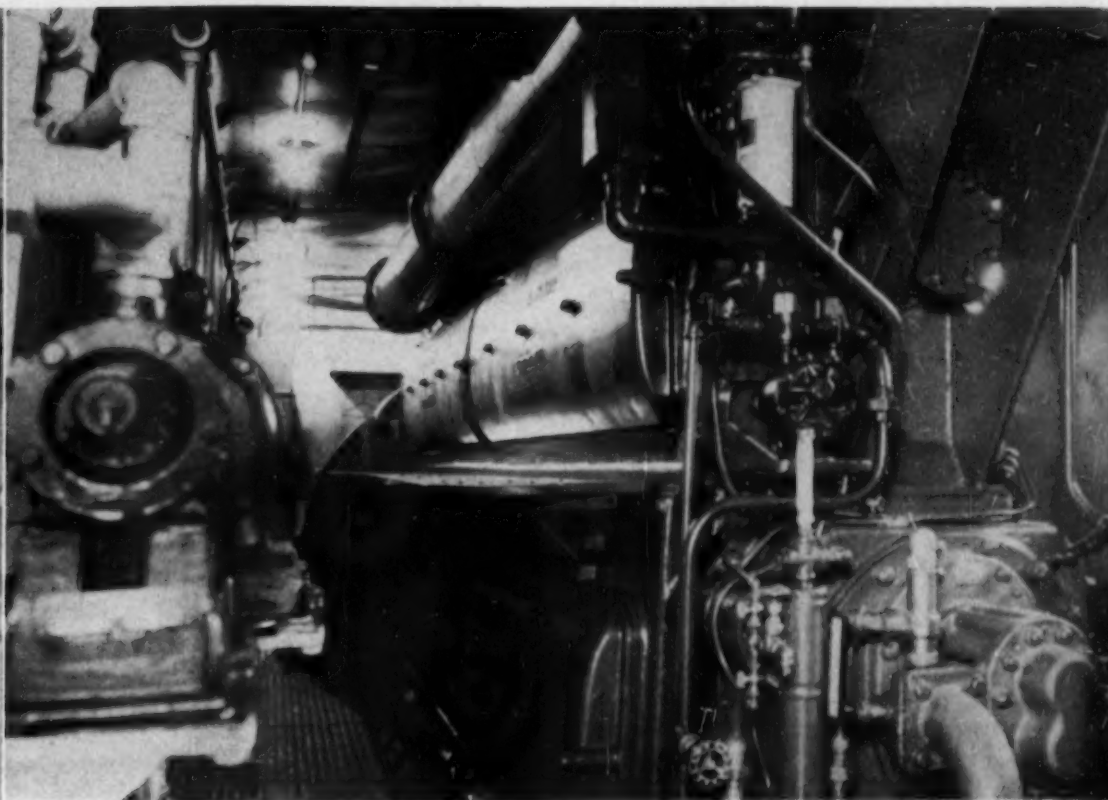
When stationed for standby service, the mobile unit is unattended. One of the company men in the lo-

The diesel drives a 760 kw. Elliott generator with a 10 kw. exciter mounted on the generator to save limited space.





air tanks, center rear a compact workbench, and to the right is the Alco oil cooler.



Other side of the Alco diesel rated at 1080 hp. at 600 rpm. This heavy duty diesel is mounted in a specially constructed railroad car.

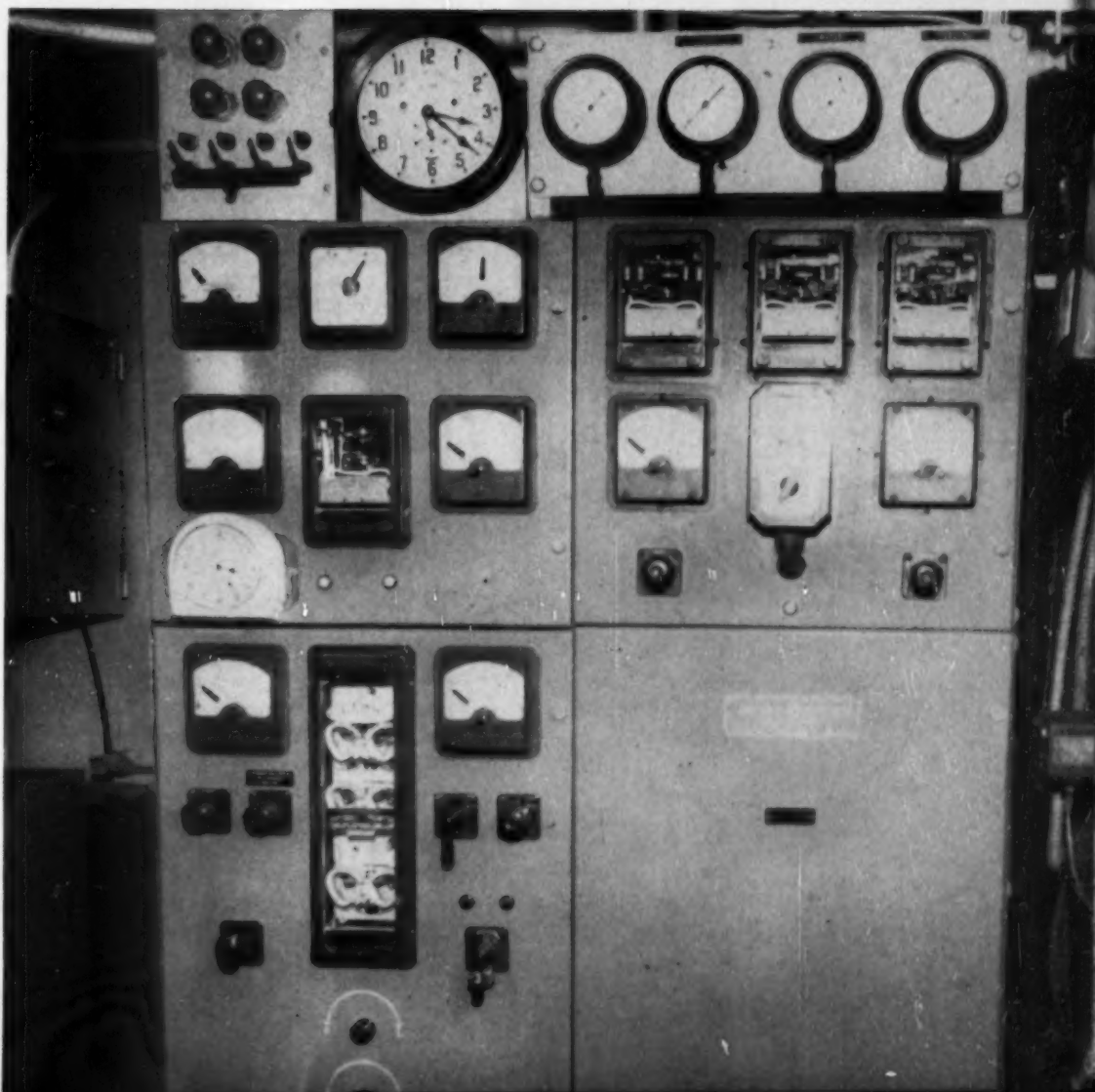
cality runs the engine for 2 hours once a month to make sure it is ready for work when needed. If an emergency occurs, the local man starts the diesel and supervises its operation. On the other hand, if the engine is to be run for an extended period, the company sends a crew of three men from one of its big steam plants to operate the diesel on a 3-shift basis. Mobile Unit No. 1 has an honorable service record, having been used in Minnesota, North Dakota and South Dakota for standby and emergency use and to supply power to communities during the rebuilding of substations and transmission lines. This diesel has been in actual operation as much as 4,000 hours in a single year.

List of Equipment

Engine—One 1080 hp., 8-cylinder, 12½x13, 600 rpm., 4-cycle, supercharged diesel. American Locomotive Company.
 Generator—One 950 kva., 760 kw., 3-phase, 60-cycle, 4160/2400 volt, generator. Elliott Company.
 Fuel transfer pump—Tuthill.
 Fuel injection pumps—American Bosch.
 Lube pump—Geo. D. Roper.
 Lube filter—Hilliard.
 Lube cooler—American Locomotive Company.
 Jacket water pump—Deming.
 Starting air compressor—Cartis.
 Auxiliary engine—Onan Gasoline Engine driving 3 kw. generator.
 Switchboard—ITE.
 Exhaust pyrometer—Brown Instrument Company.
 Switchboard instruments—General Electric.

The ITE switchboard holds GE instruments, diactor regulator and synchroscope, a Brown exhaust pyrometer and pressure gauges.

A CIVIL DEFENSE INSTALLATION



Fruit Growers Supply Co., successors to the famed Red River Lumber Co., who pioneered the introduction of diesels into logging more than 25 years ago owns this Model LMSWL Mack which was caught with a load of 30,000 board feet of logs. Engine is 275 hp.

Service is all-important in keeping diesel trucks at top efficiency. Here is a Peterbilt getting service on the Michigan-California Lumber Co. 60 foot lubrication pit.



BUNYAN FLEXES DIESEL MUSCLES

By F. HAL HIGGINS

MECCHANIZATION of logging in which the Pacific Coast has led the world for more than a quarter century is nearly completed and adopted by leading lumber companies. For the first time in years, there was no machine exhibit and demonstration as part of the program. The 43rd annual Pacific Logging Congress, held in San Francisco last November proved this and left the visiting writer pondering what he had seen and heard of the rugged boys with the calked boots and their machines over the past quarter century since

he had begun visiting them when he came west from Chicago late in 1927. "Paul Bunyan" was the mythical super-logger who measured his "Blue Ox" in "x" number of ax handles between the eyes in sizing up his pulling power when hitched. When Paul and his Blue Ox teamed on the job there was no chore they couldn't do if any good story teller could think up the feat. Well, Paul has added to his stature and work as a result of re-tooling his industry with a diesel-flexing of his muscles.

DIESEL PROGRESS



43rd Annual Pacific Logging Congress Held in San Francisco Sans Machine Demonstrations Because Re-Powering Since War's End Has Solved Old Problems

The Cummins Engine Co. is one of the leading elements in re-equipping the gigantic Mr. Bunyan. This firm was just starting to get into the woods as it grappled with and fought to a standstill its service problems out over highways, and up in mining and logging territories all up and down the West Coast back in 1934 when the writer returned to the West Coast. Everybody wanted to get into diesel manufacture but few could go up against the staggering headaches of ring sticking, liner scratching and scoring, bearing failures and lack

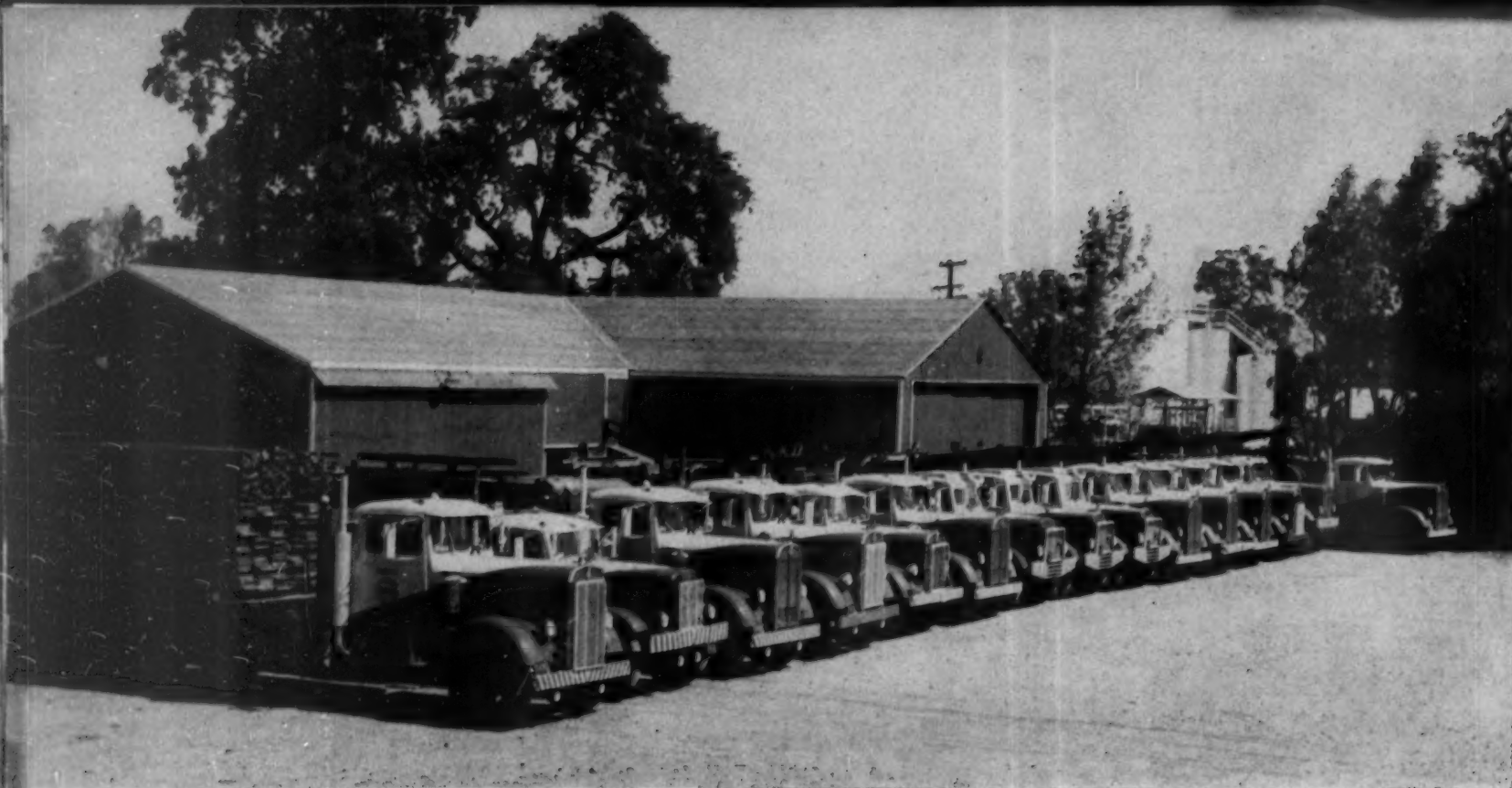
of fuels and oils for the diesels. But among those who were in at the start in this rugged battle to make the diesel perk was big sales manager Meehan of Watson & Meehan, San Francisco. Mr. Meehan was the first Cummins man the writer spied as he toured the St. Francis hotel where most of the Logging Congressmen were housed. "We're just going into a technical meeting here in these rooms," said Meehan. "Come back in an hour when the meeting breaks up and I'll help you with your logging story."

APRIL 1953

Photos Courtesy Watson & Meehan

The smell lingers in spite of the change-over from gasoline to diesel. The "Skunk" is now a dieselized railcar that operates over an 80 mile round trip between Ft. Bragg and Willits, Calif. The name given it in pre-diesel days sticks despite the days of gas fumes are gone with the change-over to a 150 hp. Cummins engine.





Logs and finished lumber are the transport job of this fleet of 11 Kenworths, 3 Peterbilts and 2 Autocars. (One truck is not in the line-up.) Operated by Ruelle, Inc., Willits, Calif., they haul redwood and fir to Redwood Products Co. at Willits.

So the writer moved on to interview oil, truck, loader, tractor, road building blade grader, shovel, crane and dragline manufacturers. All are now diesel fans and building equipment powered by such power, whether built by themselves or by one of the big engine manufacturers who compete with Cummins. But Cummins is the big logging engine outside the tractor field and has gained the kind of a reputation its sound policies and super service has won for it over the past 30 years. A visit to the Watson & Meehan office at 1360 Folsom Street, San Francisco, revealed what a deep power furrow this firm had plowed in the mushrooming lumber production industry of the West Coast in the past

quarter century. Look at the pictures and you get an idea of what a job Watson & Meehan has done for the logging industry of the West, the heavy equipment industry and the nation. Not only did Watson & Meehan whip its ring, liner and bearing problems that came to the industry the minute the high-speed diesel got into production and began going out over the world to burn any fuel smart and indifferent operators fed it, but it has set the pace for the diesel engine industry that has raised the standards of all and made the Western logging industry the most efficient lumber producing area in the world. No war or post-war demands of a home-hungry population could set a demand too

high for the modern dieselized logging industry to meet with its skilled, experienced diesel labor.

"Over this Western logging area we have all types of terrain, climate and labor to contend with," explained one logging executive. "We may be trucking out logs from inaccessible mountain areas in one spot near sea level and not 20 miles away be working in snow and ice at an altitude of one mile or more. In one spot we will be logging redwood with logs 4 to 6 or 10 feet in diameter. Indeed the western logging industry on the production end has been overhauled, re-powered and integrated into the U.S. industrial system to secure its place

One of pair of Model LMSWL Mack trucks owned by Crane Mills, Corning, Calif., which were changed-over to Cummins 300 hp. for hauling pine and fir from Mendocino National Forest to a mill in Paskenta.

This Washington "Trackloader" with Cummins 200 hp. transmits its power





A Model L Cummins engine powers this 4-speed Washington yarder for the Union Lumber Company at Fort Bragg.

in the national economy against economic forces that might well have shoved it to one side in favor of substitutes had the management faltered in its daring know-how to cut costs and increase efficiency of labor with more work done easier and faster."

Here are some of the uses of the diesel engines in western logging: Trucking of big loads on long hauls by the top concerns that set the pace in logging efficiency. The highways have been full of big diesel trucks of all makes competing for the long-haul business of bringing lumber from mill to export and retail yards. International, Mack, White, Sterling, Diamond T, Peterbilt, Kenworth brands

of trucks have been taking on the big long-haul loads of both logs and finished lumber. In the woods, 18 different models of Cummins engines are sold and serviced out of the dealerships at Portland, Eugene, Pendleton, Grants Pass and Eugene, Oregon. This is from the Cummins Diesel Sales of Oregon, Inc. Cummins Diesel Sales of Idaho, Inc., is headquartered at Boise, Idaho. Watson & Meehan have two headquarters for distribution and service: San Francisco and Fresno. Mark Ogden, Meehan's information director in the San Francisco office, pointed to two big trends as he sorted out proof of the dominant diesel use on different logging jobs that more or less key the trends: (1)

There has been a landslide trend to diesel away from steam and gasoline in the logging industry of the West. Many of these pictures represent repowering to replace steam and/or gas. (2) Lumber for homes, industry and government has been held down in cost very markedly as a result of the whole new industry of lumber transportation from mills to big jobs and yards retailing to smaller construction jobs. The writer would add No. 3 in the trends: The accumulated mechanized know-how augurs well for the future in keeping the industry abreast and ahead of its competitors if and when the going gets tough from changing times to a slower expanding economy.

through a Twin Disc torque converter for Walter G. Brix, Inc. at Briceland.

The trucks of this type in J. J. Rossi & Co.'s fleet of 23 units have no relation to the loggers' traditional "skid row." Rossi is a contract hauler for Union Lumber Co. of Fort Bragg.



THE MILWAUKEE ROAD

10,000 Mile Milwaukee System Operates 700,000 Diesel Hp. and Modernizes Its Electrification to Diesel Standards

By CHAS. F. A. MANN

GREATEST railroad enigma in North America is the Chicago, Milwaukee, St. Paul and Pacific system, with its 10,000 mile line sprawled from below Terre Haute, Indiana to the tip of the Continent, 150 miles west of Seattle in the Olympia Peninsula, in the state of Washington. Actually this great system suffers from but a single ailment—an ailment sort of inbuilt into the company since it became ambitious in 1908 and emerged from the status of a prosperous "Granger" line to a transcontinental system that was directly floored by the opening of the Panama Canal in 1920 to commercial traffic.

That ailment has been too little traffic for this sprawling giant to haul. Hardly another large system in all the world has had the fantastic history, the booms, bankruptcies, battles between Chicago and Wall Street financiers, one of the longest strings of wonderful railroad "firsts," and lastly, caught in the middle of the greatest economic reverse ever to befall all the northern transcontinental systems—the Panama Canal itself.

It started fighting its original limitations as a prosperous Midwest "Granger" line that had grown fat and much loved by its customers in the vast North Central farm belt, back in 1908 when the board of directors decided the bridge to Asia for American trade lay by rail to Puget Sound and steamer to Japan, China and the Philippines. The California route was too long. The Panama Canal dream was too fantastic. The great historic fact remains today in that California actually had but two great transcontinental systems, while the Northwest had 5, and by the great ironies of history and the immutable laws of economics and compensation, the reactions and actions resulted in the focal point of highway transport in America to be in California, and the Western focal point of commercial and industrial supremacy to swing to the Southwest and until recently, away from the Pacific Northwest, because of this great, historic fluke in Western transportation, and the discovery of oil in California and the pressures that brought about the Panama Canal.

The Milwaukee's historic decision to mortgage heavily a prosperous railroad and build to the Coast, gave rise to the last great railroad battle of American history. With the Northern Pacific and Great Northern controlling every key traffic point west of St. Paul, and wily old E. H. Harriman's Union Pacific everything west and northwest of Omaha, it was a bold, brash decision to cross the Missouri at Mobridge, South Dakota, and strike straight to Puget Sound, to seek its share of the lush rail-ship traffic on the old bridge to Asia across the Great Circle ship lanes of the North Pacific. Fuel supplies hit their plans first. Most coal

in the area was already bottled up. The Southern Pacific was even firing its steam engines from coal mined near Tacoma and hauled by ship to San Francisco, before their great Oil Era exploded in their very faces on SP land grant acres. Land and terminal acquisitions proved dynamite. From Butte, Mont. west, the Milwaukee stolidly "paid through the nose" for every foot they bought; every bridge and yard site and finally, to break bottlenecks, got into Spokane, Seattle and Tacoma on joint trackage deals with of all things, the shrewd old Union Pacific, and a coal haul road, the Pacific Coast railroad that tapped coal mines near Seattle for the California trade.

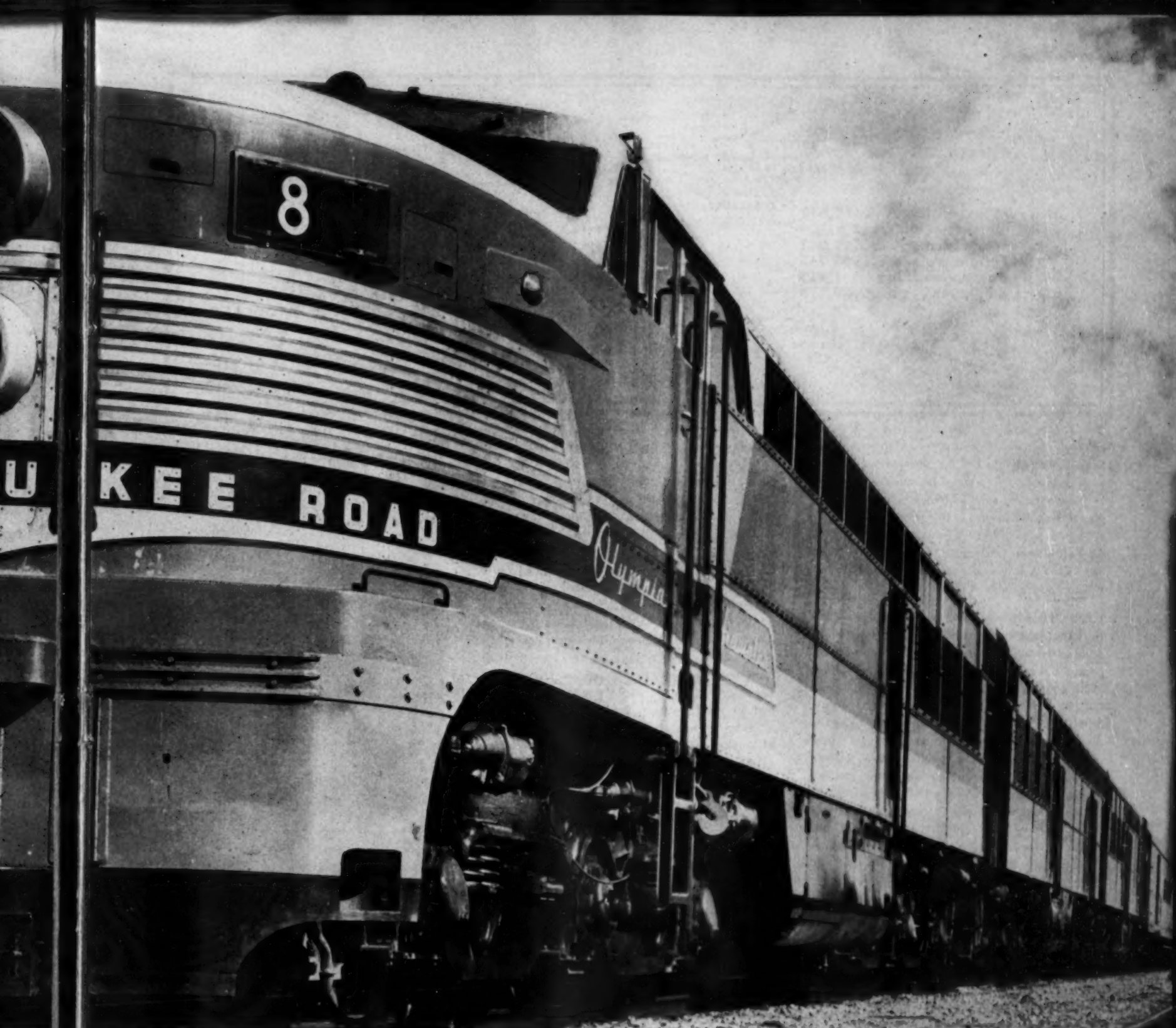
Finally, one day in Chicago, those daring Milwaukee directors abruptly decided that fighting the six mountain crossings in order to give them a straight fast line to the Coast, the shortage and artificial prices for fuel partially the result of actions of their competitors, the cheapness and magnitude of the supply of hydro generated electricity, why not electrify from Eastern Montana to Tacoma and Seattle and to "H. . ." with all our major operating problems? In one decision, a Western Extension slogging along with expensive steam power for barely three years since it opened, became the "diesel pioneer" or the "gas turbine pioneer" of its time. The Milwaukee would electrify nearly 700 miles of its Western system, cut costs, speed up trains and give passenger travellers an allure that would out-pull its competition forever!

To survey the Milwaukee in its splendid, 1952 rebuilt condition, without strong praise and deep analysis of its electrification, is to miss part of the background of experience upon which the whole world diesel railroad program is based. The 660 route miles of Milwaukee electrification in Montana and Washington, representing 925 miles of electrified trackage, represented at the time of their construction the most daring, courageous piece of railroad enterprise of the pre-World War I period. The project, by today's costs, seems peanuts. For approximately \$24,000,000 the trolley, transmission lines, substations and locomotives, were bought and installed complete! Today exactly the same purchase would cost nearly \$70,000,000 to install. Operation of the two electrified zones over 5 mountain ranges built up the basic knowledge upon which today's modern diesel electric locomotive is built. The dc. traction motor with its geared drive, the electric motored air compressors, regenerative braking on downhill operation, signal and telephone circuits and control systems, basic design of the running gear, motor ventilation, weight distribution, etc., all had their roots in the Milwaukee's simple, rugged GE and Westinghouse equipment that was turned loose in the far West to shift for itself for 40 years, under the most fan-

tastic of operating conditions and the most fantastic lack of progressive maintenance routines any railroad ever subjected its equipment to!

The Milwaukee's two-system feud left the East end of the system treating the lonely West end of the system like an unwanted stepchild. Only rugged mechanical equipment could survive this kind of a protracted ordeal. The Milwaukee, after its second receivership, before World War II, found its gold right out on the tracks that, after 40 years, were still located and ideally engineered to do a terrific job, but needed integration of a house divided railroad system into a single, smooth unit, involving a whole new management approach.





Fairbanks-Morse passenger diesel on a Milwaukee streamliner.

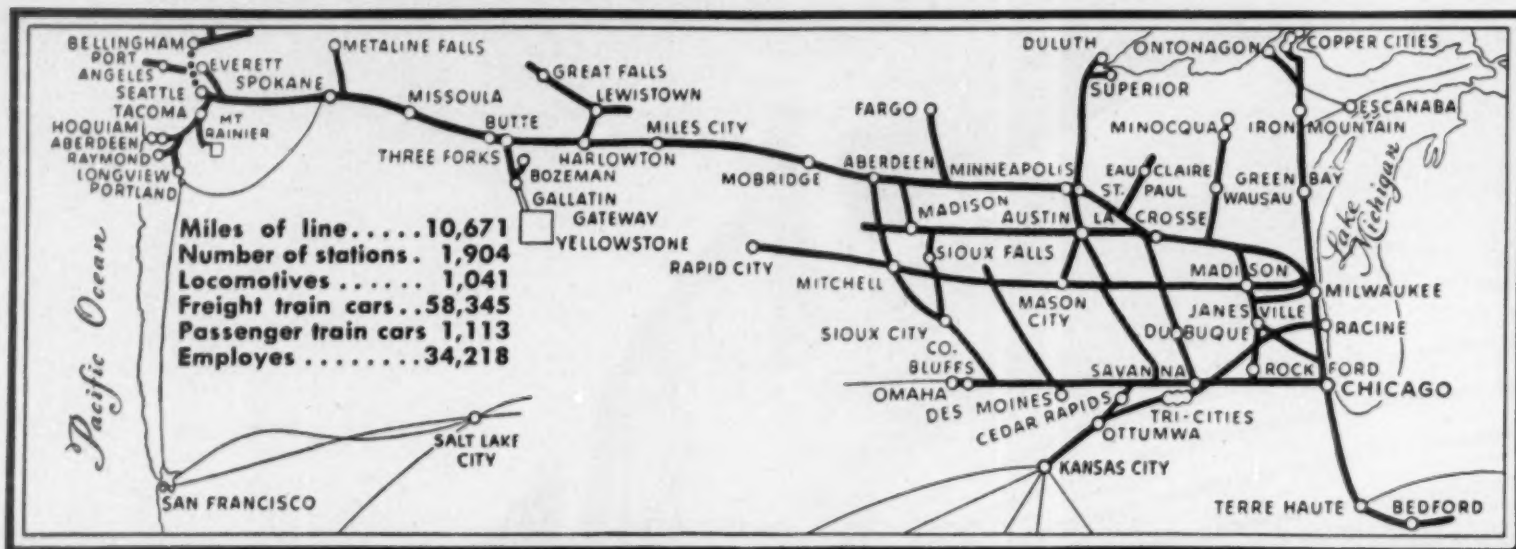
Historically, the Milwaukee's Western Extension divided its management house into two bitter factions. Those who were glad their railroad grew into a transcontinental system when it went West, and those who held a grudge and believed it should have stayed a Granger line, like the Northwestern Railroad is today. There grew up a two-system duality within the Milwaukee that lasted through a whole lifetime of management. The West-end literally, especially in lean years, had to shift for itself. It was the poor relation that had to beg to keep going. The Lines East crowd crowed over their traffic gains; their marvelous innovations and inventions at Milwaukee shops; got all the major

appropriations out of the annual budget and the personnel became imbued with a spirit of scoff and phoo at Lines West.

After the second receivership was settled the first thing management did was to boldly start welding the two fighting halves together into a single railroad, coincident with a tremendous program of personnel housecleaning. It ended the day when picturesque, but over-age prima donnas could hang on to their jobs till they reached 85 or 90, a Milwaukee tradition that became a national railroad joke. It picked up a fellow named John Kiley and began grooming him for president, mostly by

shooing him off to Seattle to start asking questions. With him came a novel system of direct reporting to the boss. To heck with "channels."

Then it began peering into the Milwaukee (Wisconsin) shop hierarchy and finding startling things. One thing it found that over the years every American manufacturer and inventor had at one time or another sold the Milwaukee railroad at least two of their brainchildren! Boiling its mechanical problems down, it seemed that first of all, its much abused, undermaintained electrified zones should either be scrapped and completely dieselized, or thoroughly modernized. Secondly, it should junk its vast fleet of assorted prima donna steamers and



standardize on a few wide-range types. The psychosis of the costly Western Extension and electrification, actually blocked the Milwaukee's thinking toward diesels. The east end boys saw another costly motive power ogre in diesels, one that might give them fresh jitters. So like good traditionalists, they promptly ordered a whole fleet of big new 4-8-4 all purpose steamers at the dawn of the diesel age, like the Southern Pacific, New York Central, Union Pacific, and N.P. did.

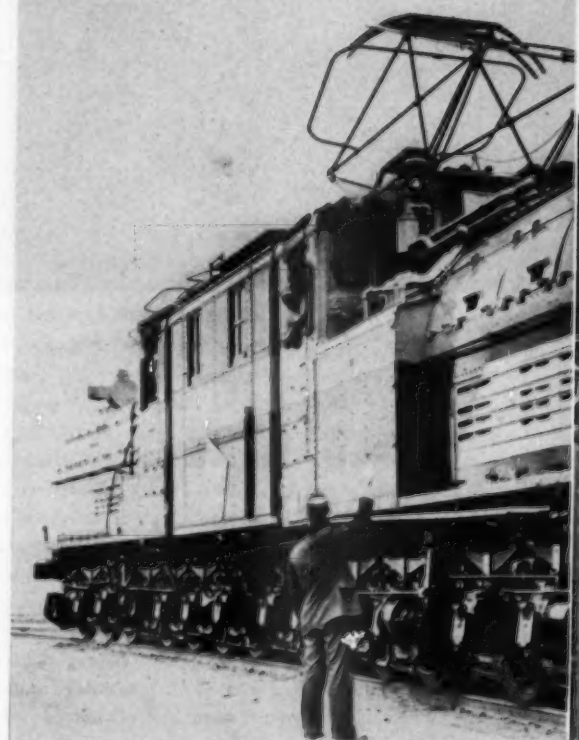
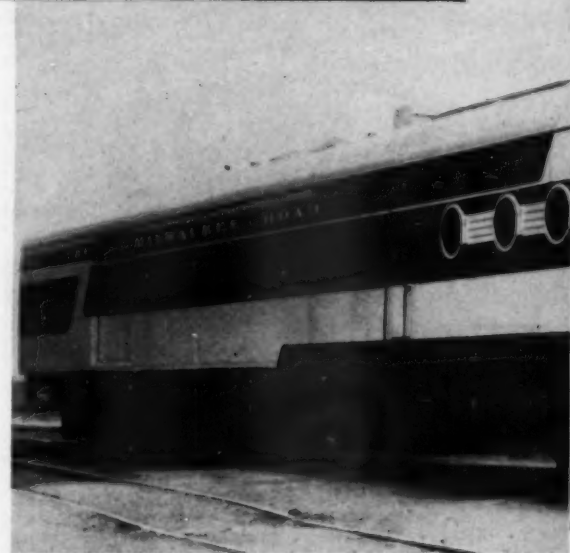
Finally, in 1941, when the sensational behavior of the new Electromotive freight diesel, with regenerative or dynamic braking, out on the Santa Fe, had proved out so remarkably, the Milwaukee took the fleeting moment and bought its first freight diesel, No. 40, a 5400 hp., EMD with full regenerative braking, to run, of all places, across the gap between the two electrified zones, between Avery, Idaho, and Othello, Washington! That historic moment began a series of fast changes in management's thinking that led to today's magnificent integration and re-powering of the entire railroad!

Up to that point, the whole idea of diesel was one of deepfreeze. Here, because the 200 mile non-electrified gap had 40 year old steam facilities that had to be rebuilt, such as fuel and water facilities, the fact that the passenger line via Spokane kept traffic so low on the direct line between Avery and Othello as to preclude bridging the gap with electrification, the possible quickie solution was to buy one diesel freighter and keep it running at top speed back and forth hauling long freights in each direction as fast as it could spin. The Lake Chatcolet grade and the long downhill slide west of Malden made it useful to use dynamic braking. The big electrics hauled 5000 tons into Othello from the West, and the diesel could, on the easy grades, haul 5000 tons from Othello to Avery. The pressure of competition way over at the other end of the system, already was beginning to see the end of steam on the Hiawatha speedliners out of Chicago, and diesel seemed to be the answer. So while its first freight diesel ran on the west end, the first pair of 2000 hp. EMD passenger diesels took up the Hiawatha job out of Chicago, each making a round trip per day.

The diesel bug took hold rapidly after these two preliminary steps were taken. The Othello-Avery

freight run proved so wonderful as to service and cutting costs that another was ordered for use on this freight-gap between the two electrified zones. Steam continued to pull the passenger trains on the Spokane Line. Meanwhile strong attention began to be paid the electrification. What to do? Buy a fleet of diesels and sell the electrification for scrap? Keep the electrification for freight and run diesels through the electrified zones? Then came the retirement of the brilliant engineer who built the electrification. Taking over was a younger man trained as a division superintendent on the tough coast division at Tacoma, which operates everything from Othello to Port Angeles and south to Longview and north to Bellingham. His name is Laurence Wylie, a graduate electrical engineer who had the good fortune to learn operating as superintendent of one of the toughest divisions on the Milwaukee. He stepped into the job as boss man of the electrification department, headquarters in Seattle. The day he took over was the day when it became necessary for the company to decide at once what to do about its electrification.

Five years ago big plans were being made to streamline the western passenger service and chop off 12 hours from the schedule. The east end boys, after learning the diesel facts of life on their own fast Hiawatha trains, had gone hog-wild and proposed to run the Olympian Hiawatha straight through from Chicago to Tacoma, with diesel all the way, and ordered five 3-unit Fairbanks-Morse passenger diesels to do the job! Meanwhile Mr. Wylie went to work. His terse reports direct to the boss, showed that instead of cussing the electrification, the Milwaukee owed it a heavy debt of not only deferred maintenance money but gratitude as well. As far as he could ascertain, the whole electrification had been running on hot air, practically no maintenance, no decent shop facilities and nothing but the integrity of its builders, since 1915! Two things became obvious at once: First, how could any railroad get the most out of equipment that was wearing out and suffering from patchwork treatment. If she stops, put a new fuse or a new batch of thicker grease in the crankcase and get her going. If she keeps on running, do nothing. Second, the whole electrified areas were operating way below proper voltage. No wonder fast passenger trains slowed down between substations with

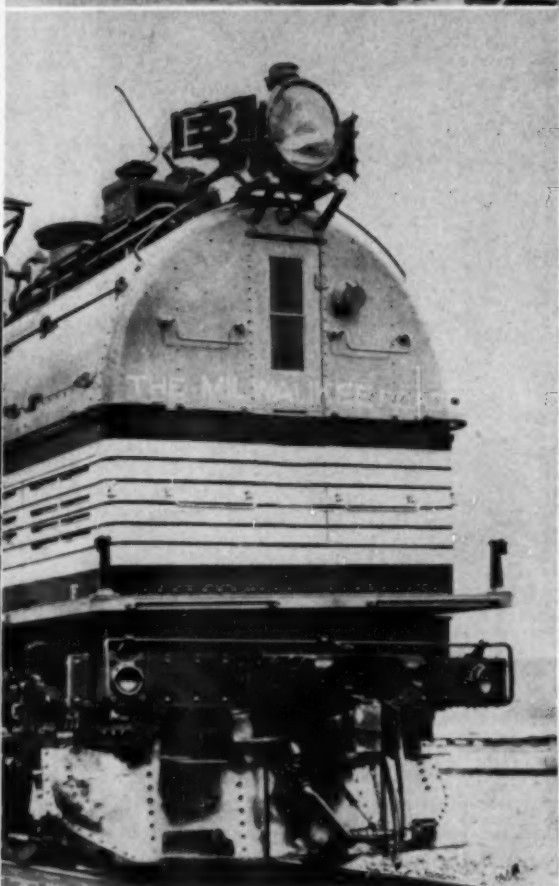


DIESEL PROGRESS

voltage hanging anywhere from 2200 to 2800 at the locomotive cab!

Mr. Wylie promptly recommended that the voltage be raised at substations to 3400 so out on the line it would never get much below 2800 volts even with heavy trains operating close together. His solution to the question of how to raise substation voltage without renewing every motor generator

Below Top: Two of these ingenious 6-wheel diesel railcars were built for special duty on long branch lines not requiring full trains. Powered with 1000 hp. EMD 12-cylinder Model 567 diesels. *Below bottom:* The famed bipolar gearless electric passenger engine. It has 12 motors. Built in 1918 by GE and modernized in 1952.



set was simple and startling: Simply reduce the clearances between the field coils and the armature by a simple mechanical operation. His reasoning immediately was that with the constantly rising trend in diesel fuel prices and the fact that his researchers discovered that the company's two basic power contracts had not been revised downward in 30 years, the Milwaukee should not only keep diesels out of the electrified zones, but should immediately adopt every single feature of progressive maintenance used in operating a fleet of diesels, for its electrification setup. By increasing the consumption of electric power on revised power contracts,—run more trains and avoid the dips in the power curve, the electrification would be far cheaper, and since it was written off, keep and expand it.

Next was his idea to completely rebuild the aging electrics, progressively, and build a new electric locomotive shop at Deer Lodge, Mont., to do the job for Montana, and rebuild the Tacoma locomotive shop for the coast division section. And finally, the lucky break of suddenly having the lines east boys start thinking kindly of the electrified part of the system, simply because they lost the fear of it when they had to learn how to run their expanding fleet of diesel power, gave rise to buying, in 1950, a fantastic fleet of 12 brand new 5100 hp. GE single unit electrics, when a deal between GE and Russia fell through at the insistence of our State Department. The first new electrics purchased by the Milwaukee since the bipolar passenger electrics were purchased in 1919. Ironically, it is the cold truth that diesels, on the Milwaukee, saved its electrification, because the management, for the first time, became used to handling locomotives with motors doing the work, instead of steam.

Meanwhile the diesel enthusiasm mounted and the day came when the Olympian Hiawatha went into service with its 6000 hp. 3 unit F-M diesel running all the way from Chicago to Tacoma (Seattle is not the end of the line). At first it seemed to work well, but soon it was realized that 6000 hp. was too much on the light shorter train, and there was a waste of power. Then, with the new inspiration to revamp the electrification and improve operation of the electrics, the idea of using diesel through the electrified zones was dropped, particularly after 2 of the 12 new GE Russian type electrics were converted to fast passenger engines for the run through Montana. Before they went in service, the old Westinghouse electric passenger engines were too slow for the new fast run through Montana. Today, the Olympian Hiawatha and the Columbian run from Chicago to Harlowton, Mont., powered with 3-unit 4500 hp. FP type EMD diesels; from Harlowton to Avery with single unit "Little Joe" electrics; from Avery to Othello, via Spokane with 2-unit 4000 hp. EMD passenger diesels and from Othello to Tacoma with 3500 hp. bipolar electrics.

The Milwaukee electrification consists of the Rocky Mountain Division zone, 443 route miles, extending from Harlowton on the east, to Avery, Idaho, on the west, and crossing three major mountain systems. The other zone is the Coast Division with 219 route miles extending from Othello, Washington, once a lonely desert outpost in the dreary central Washington Columbia Basin, but now one of the three key boom towns in the Northwest. The line

runs from there to Tacoma and Seattle, crossing two major mountain ranges.

To serve the 3000 volt trolley system, there are 14 substations on the Rocky Mountain Division, averaging 32 miles apart and 8 substations on the Coast Division averaging 28 miles apart, which convert 100,000 volt alternating current from a transmission system paralleling the tracks to 3000 volt dc. trolley current through motor generator sets.

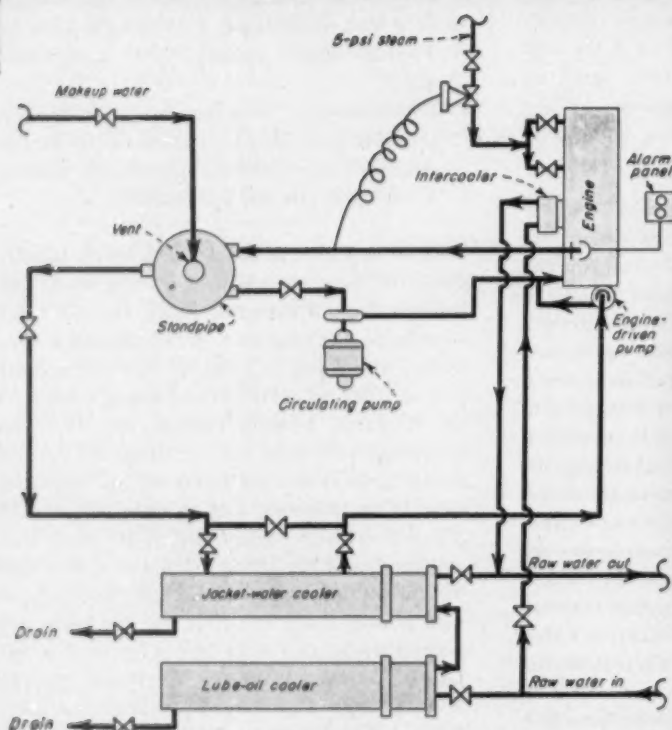
The electric locomotive roster consists of the following:

1. 80 GE freight units developing approximately 1700 continuous hp. each. They are divided up into eight 2-unit; twenty-four 3-unit and six 4-unit locomotives and used for freight on both zones. All built in 1915-1916.
2. 10-5100 hp. General Electric single cab freight locomotives, (Russian designed and Milwaukee modified), new in 1950. Generally run in pairs as "Big Joes."
3. 2-5100 hp. General Electric single cab Russian designed. Modified for passenger service. New 1950. Run singly as "Little Joes."
4. 5-3,500 hp. bipolar passenger electrics made 1919-1920 by General Electric. Gearless type, with 12 motors. Used exclusively on Coast Division.
5. 2-2-cab GE passengers converted and streamlined and rebuilt from 4 GE freight units, at Tacoma shops, January 1953 (completion date).
6. 6 Westinghouse, twin motored geared passenger units, exclusively used in Montana. 4200 hp. All electrics equipped for regenerative braking.
7. 3 GE single cab, 500 hp. switchers.

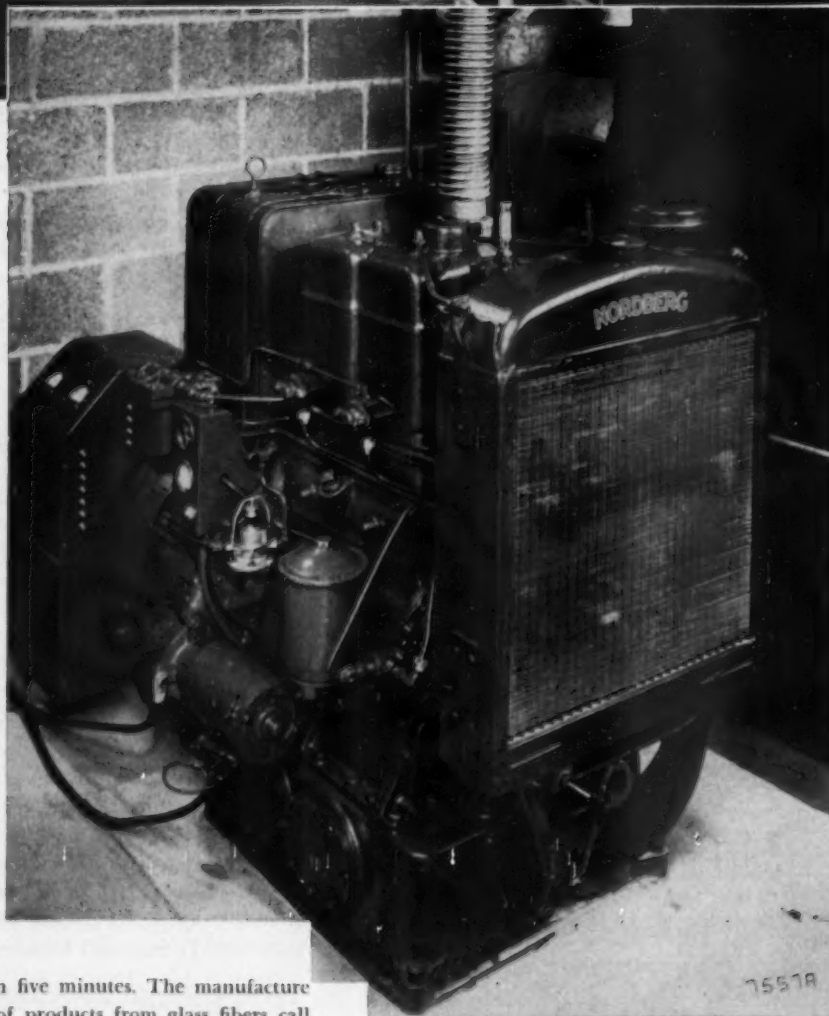
Prior to the advent of diesel No. 40 for the historic pioneering between Othello and Avery, on the gap between the two electrified zones, and the timid experiment that same year—in fact almost the same month, with a pair of 2,000 hp. Alco and another pair of 2,000 hp. EMD diesel passenger units on the Hiawatha, between Chicago and the Twin Cities high speed noon run, the Milwaukee dabbled mostly in diesel switchers of the 600 hp. variety for some of its terminals, starting along about 1939. Today it operates a grand total of 349 diesel locomotives, comprising 529 units, for a total of 685,180 hp., plus two 1000 hp. diesel rail cars equipped with heating boiler and large baggage space, and 6-wheel trucks! Out of its fleet of 57 diesel freight locomotives, but 14 are of the 4-unit type—all EMD's. 37 are 3-unit 4500 hp. EMD's and 3-unit F-M's and 6 are 3000 hp. 2-unit EMD's. A study of the operating pattern reveals the interesting fact that 47 out of the 57 freight diesels operate into large pools—the Milwaukee freight diesel pool, serving heavy freight schedules north and west, with 19 assigned locomotives and the Bensenville (Chicago) freight diesel pool of 28, 3-unit, 4500 hp. EMD diesels serving points straight West and Southwest. Maintenance at Bensenville and Milwaukee takes care of these 47 freight diesels, as well as most of the fleet of diesel switchers.

This article will be continued in the next issue of DIESEL PROGRESS.

MORE CIVIL DEFENSE INSTALLATIONS



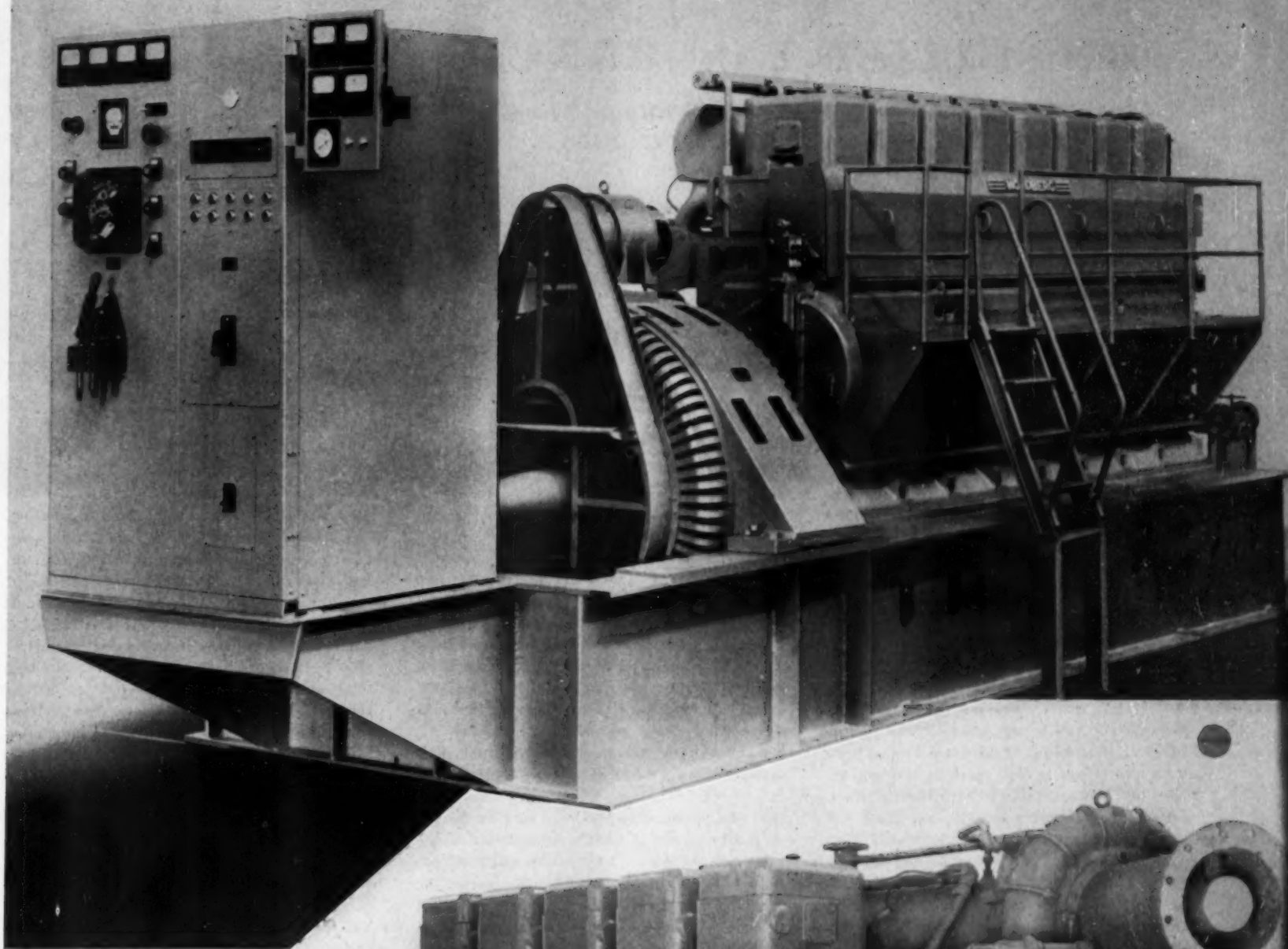
COOLING-WATER SYSTEM is fed with low-pressure steam during idle periods to keep water at 120 F. Small circulating pump maintains constant flow through jackets




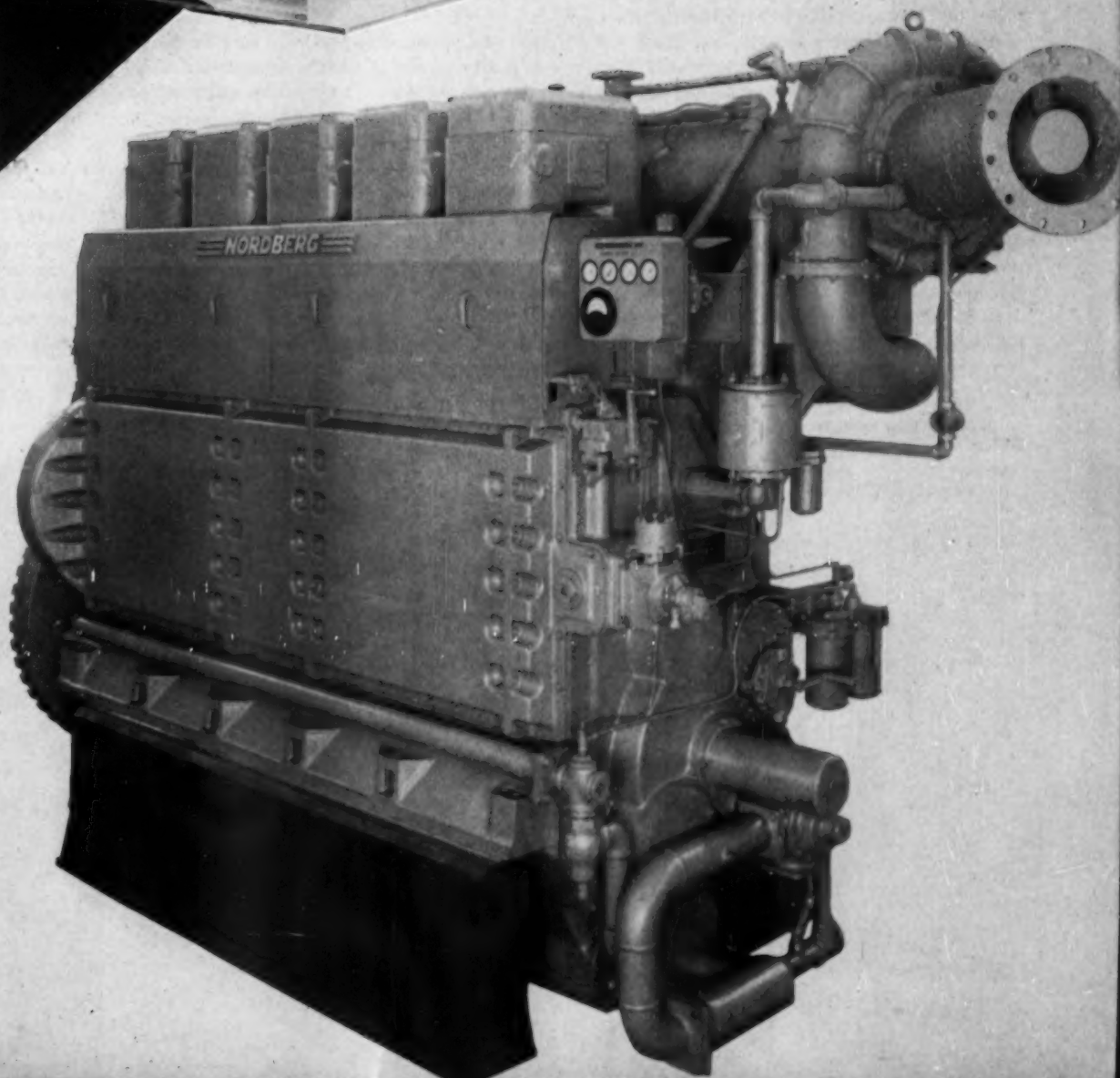
HERE are four examples of the practical application of diesel emergency generating sets to Civil Defense. The one above is owned by the Owens-Corning Fiberglas Corp., Santa Clara, Calif. The cooling system is also illustrated, showing how the jacket water is heated during idle time. It's a 718 hp. Nordberg four cycle diesel driving a 500 kw. generator, an eight cylinder 9x11½ unit. It saves its cost every time there is a power line fail-

ure of more than five minutes. The manufacture and fabrication of products from glass fibers call for continuous operation of furnaces and process machinery, 24 hours a day, 365 days a year. A power failure just ruins this type of processing machinery—the liquid glass cools and tangles everything. So whether it be line failure due to storms or due to enemy action, this diesel emergency generating set is right there to go to work when the voltage drops.

Another typical emergency diesel generating set installation is this Nordberg 4 cycle, 2 cylinder, 4½x5¼ diesel generating set rated at 30 hp., 20 kw. at 1800 rpm., which was installed for emergency requirements at an East Coast ceramic manufacturing plant, which also operates on a continuous cycle.



 Nordberg 4-cycle, 8 cylinder, 13x16½ supercharged diesel generator unit rated 1420 hp., 1000 kw. at 514 rpm. used for emergency standby service in a Southwest REA plant.



View of Nordberg type FS-135-SC, 5 cylinder, 13x16½ engine (885 hp.) for the Northern Indiana State Hospital at Westville, Indiana.

DIESELIZED INSURANCE

Two Standby Diesels Insure McCulloch Motors Corp. Against Destruction of its Five Induction Furnaces

By JAMES JOSEPH

CLUSTERED within a few blocks of one another are five plants—all part of Los Angeles' McCulloch Motors Corp. The parent company, which moved west from Milwaukee in 1946, is a long-time producer of light-weight engines and engine-driven products. Best known: the McCulloch power chain saw. The company's aircraft division has produced the prototype helicopter, MC-4, and is currently in defense contracts. Paxton Engineering Division, formed in 1951, is McCulloch's new-products development arm. Rhodes-Lewis Co., a wholly-owned subsidiary, designs and makes aircraft components and assemblies. Another subsidiary, Pacific Optical Corp., turns out glass and plastic lenses and prisms, as well as other optical products.

Yet for all this diversification, there's a fragile core—the die casting department, heart of all McCulloch production. If this heart stopped beating, stopped turning out precision die castings which feed various McCulloch production lines, operations would likely be crippled. Thus, five plants and nearly 2500 employees have vital interest in any insurance policy guaranteeing that the die-casting department's five, 25 kw Ajax induction furnaces never experience an unplanned shut-down. "Unplanned shut-down" is engineerese for just plain "power failure."

A power failure in McCulloch's die-casting dept. wouldn't have to be long-lived to do damage. The furnaces' coils could burn out if ventilating fans were shut down but 15 minutes. With an hour-long failure, refractory units might "freeze," neces-

sitating replacement of the furnaces' castable linings. Any unplanned shut-off over fifteen minutes would cost the company, by its engineers' own estimates, no less than \$1000 per furnace—the price of new coils. Another hour would see the bill doubled or tripled. Add to this lost production, and it's pretty obvious that McCulloch needed to insure itself against electrical failure. What's more, that insurance had to be as fool-proof as possible and completely automatic.

So McCulloch bought itself a policy: two Hercules diesel standby engines, Model DFXE, 6 cylinder, 4 cycle, 5½-in. bore, 6-in. stroke, rated 120 hp. at 1200 rpm. The Hercules (part of Reiner diesel generator sets) drive Electric Machinery Corp. synchronous generators, rated 60 kw, 75 kva, 196 amps. at 1200 rpm. Working together, the units deliver an electrical output of 120 kw, 150 kva, 392 amps. They're rotating field type units with separate exciters mounted above the alternators.

The McCulloch set-up was ripe for dieselization. As plant engineer H. M. Eversz explained it, the need was immediate. "I figure it cost us \$1000 per furnace to tear down for coil replacement," he told DIESEL PROGRESS. "It's hard to believe that a 15 minute shut-down could do \$5000 worth of damage. But that's a fact. We've experienced 3 to 4 unplanned power shut-downs every year. Coil replacement and production losses were high, so we went out and bought a couple of diesel-electric units."

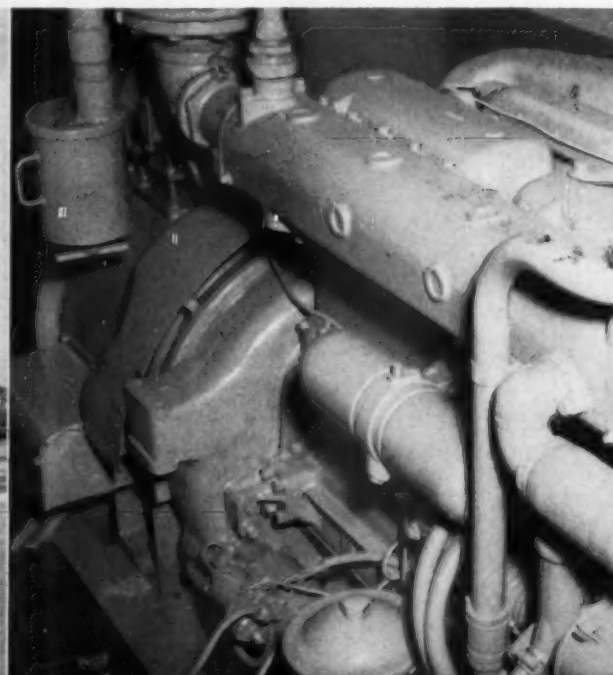
Eversz placed the diesel units in the main

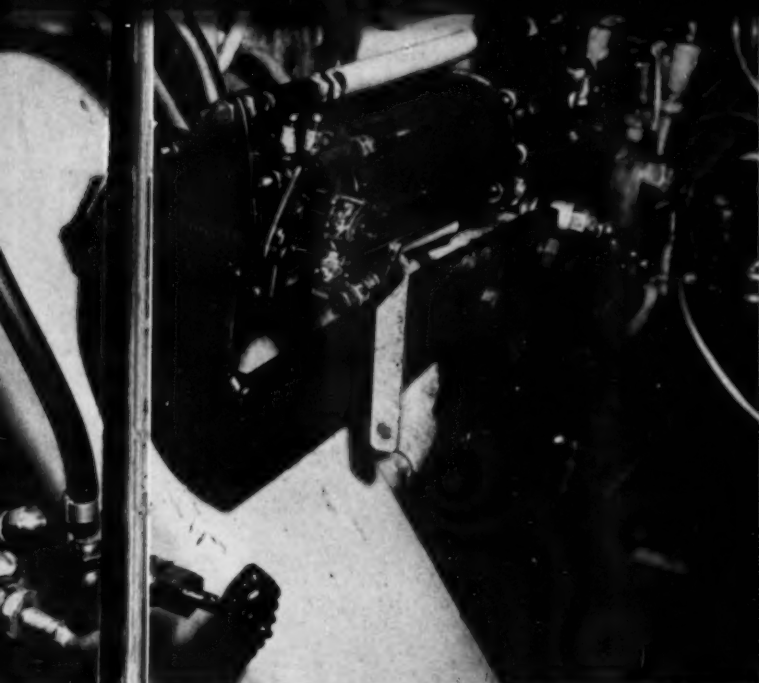
plant's basement, each in its own concrete-enclosed cell. They're specially wired so that if the power fails, and voltage drops more than 20% for more than one minute, the diesel sets kick in; simultaneously, the Los Angeles Bureau of Water and Power's line is disconnected. The diesels use batteries to get started, self-synchronize themselves, then "pull themselves" onto the line. But both speed and phase must be in step before a relay closes, putting the generators' output on the line—which powers the die casting department's induction furnaces. The diesels have also been used for planned outages. In November the Bureau of Water and Power asked to shut-off power for about 9½ hours while its electricians changed a transformer. The diesels took over, kept McCulloch's vital die-casting department powered.

In simplest operation, the Hercules diesel-electric sets operating at 240 volts, discharge into the secondary of a Sorgel air-cooled, 200 kva transformer in the plant's equipment room. The transformer steps up the output to 4160 volts. This output goes through various switchgear (General Electric, ironclad, battery-operated switching) and finally to the die-casting department where it's dropped back to 240 volts for the furnaces. When diesels

One of the Hercules diesels (part of Reiner generator set). They are Model DFXE, 6-cylinder, 4 cycle, rated at 120 hp. at 1200 rpm.

View from West Century Blvd. of main McCulloch Motors plant with Research Building at far left.

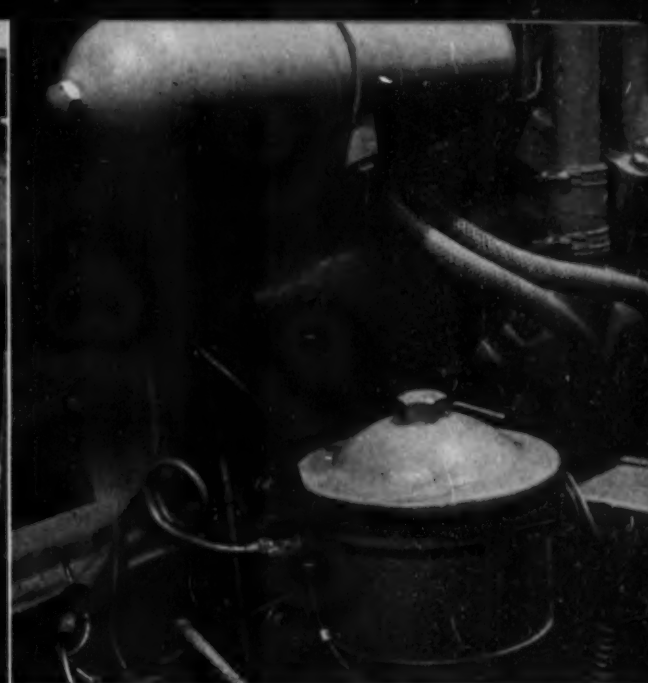




This hydraulic cylinder is for stopping the engine automatically. It is actuated from the flywheel and turns the governor.



Three section Electric Machinery control board at McCulloch. Sections to left monitor the diesels separately. Unit to right tells when they are synchronized and puts them on the line.



The immersion heater in the manifold elbow. They are 500 watt immersion thermostats and are placed in both units.

are on the line, switches interlock so the main power can't come on the line.

Diesels also supply "silhouette" lighting to various control rooms—including die-casting. This is just enough light for maintaining equipment until the main power is restored. Plant engineer Eversz, while content at present with his 150 kva units, hopes eventually to install 400-500 kva standbys. Even this would care for only the most essential electrical loads, since the main plant's total connected load is 7000 kva. Eversz chose diesel standbys because he's found them easier starting than gasoline-driven engines. Since the units were to be unattended, self-starting was highly important.

To make starting even more assured, Eversz has: (1) Rigged 500 watt immersion thermostats in the manifold elbow of both units. Thus water jackets are continuously maintained at 116-117 degrees F.; (2) Governors always in full-open position. Only trouble with set-up is that while self-starting, diesels won't shut-off automatically. To remedy this, Eversz has installed an air-operated, hydraulic cylinder actuated by a compressor run off the fly-

wheel. If the main power picks up, diesels will go to standby and the air-cylinder will pull shut the governors. In operation, when power is restored, one of the relays in the Custom Built Control (the automatic timing device which originally kicks the diesels into operation) actuates a solenoid. This solenoid controls air from the flywheel-driven compressor (2 cu. ft.) to the cylinders (60-70 psi.), closing the governors; (3) each engine uses distilled water in its water jacket. These three precautions, (1) heated jacket water, (2) governor shut-off controls and (3) distilled water, minimize starting difficulty.

However, it is realized that the diesels might fail to start. To help eliminate this chance, McCulloch has installed the Custom Built Control which has three functions. First, it closes a switch to the 24-volt batteries energizing the diesels' starters; secondly, should the engines fail to start, it automatically opens and closes the battery circuit at intervals. If, after six automatic attempts to start the engines, nothing happens, then the control opens the battery circuit and stops any further action. And lastly, the control unit operates an air-valve on the compressor which actuates the governor closing-cylinder. The Custom Built Control combines a voltage sensitive relay, a timer and a series of starting switches controlling the battery circuit. In operation, the voltage sensitive relay actuates a 1-minute timer, should the line voltage drop more than 20%. Should the voltage drop be momentary, the timer has no effect upon the diesel starting mechanism. However, if after one minute the line voltage is still down, then the timer triggers a relay which closes the battery circuit, starting the diesel. If the engine doesn't start, the control automatically tries again. After six unsuccessful tries it gives up.

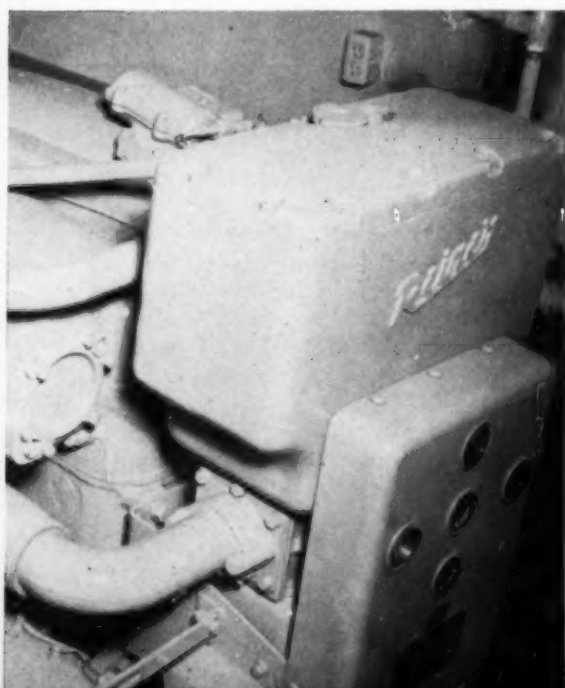
However, the diesels have never failed yet and likely they won't. Still the system for automatic starting is interesting. The manifold and return

lines from McCulloch's water tower enter the basement equipment room, where they cool compressors. A tap off this line cools the diesels' heat exchangers. Probably most important to the operation of the Hercules diesels and their synchronous generators is that one word: synchronization. If not in synchronization, the diesels do not come on the line.

Both diesel-electric sets feed to a 3 section switchboard adjacent to the main transformer. Each generator has its own control panel. The panel contains: (1) ammeter, 0-200 scale, with selector switch; (2) a wattmeter, 0-60 kw. scale; (3) volt meter, 0-300 scale, with selector switch; (4) main circuit breaker; (5) automatic voltage regulator—a Synchrostat, product of the Electric Machinery Mfg. Co.; (6) a field rheostat; (7) field switch and (8) a reverse power relay. The third panel ties both outputs together, measuring them for synchronization. This control unit contains: (1) synchroscope with switch; (2) two synchronizing lamps; (3) frequency meter with switch; (4) three ground detector lamps with switch and an automatic synchronizer.

Control panels were manufactured by Cole Electric Products Co., Inc. The two Hercules are equipped with marine type cooling systems, water cooled manifolds, electric starter, and standard accessories. Piston displacement is 893 cubic inches. The reverse power current relays, one for each engine, keep one from feeding the other. Relays are made by Westinghouse.

At McCulloch Motors, where the die-casting department furnishes fully 95% of all production castings, induction furnaces are main cogs. And standing by, in case of power failure—which could run up a \$5000 furnace repair bill in but 15 minutes—are the twin Hercules diesels. They're McCulloch's annuity against unplanned power shut-offs.



A CIVIL DEFENSE INSTALLATION

APRIL 1953

55

HYDRAULIC TORQUE CONVERTERS IN DIESEL TRACTORS



An Allis-Chalmers HD-20, hydraulic torque converter tractor working in the Steep Rock Iron Ore Mines of Steep Rock, Canada.

By W. L. BODE

ALREADY hard at work on many spectacular earthmoving and construction jobs, the newest addition to the Allis-Chalmers line of tractors, the HD 20, is proving its versatility and great ease of handling. Described as the world's largest crawler tractor, this unit features a General Motors Detroit Diesel Division engine Model 6-110. This two-cycle power plant provides a net of 175 horsepower at the flywheel. Power is transmitted through a hydraulic torque converter.

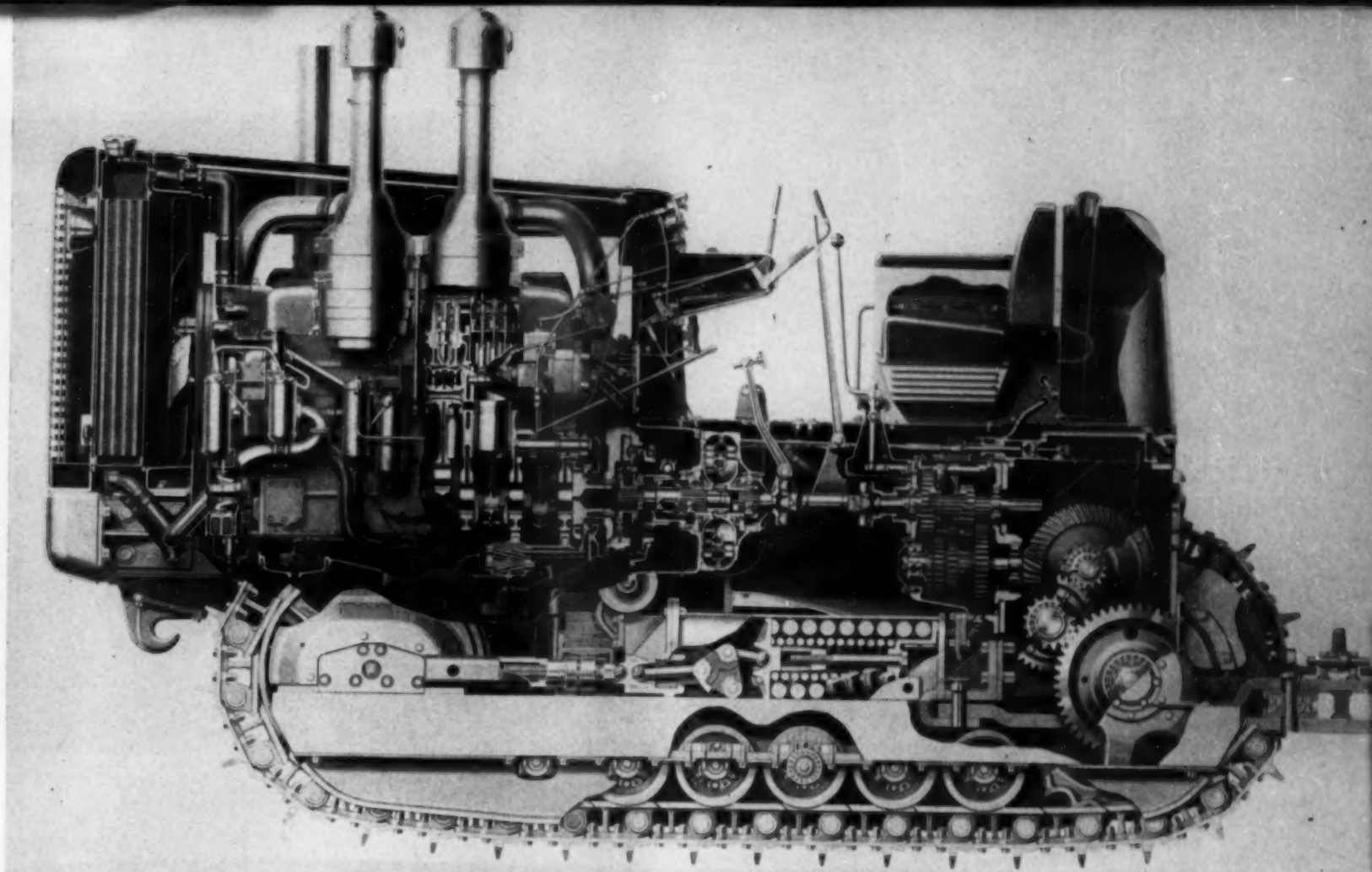
The HD 20 is a big job, big on performance and big in size. It has an approximate shipping weight of 41,000 pounds, 1,000 pounds heavier than its predecessor, the HD 19. It has a bare tractor draw-

bar pull of 36,900 pounds and a maximum drawbar pull of 65,000 pounds in low gear; and 35,000 pounds bare tractor drawbar pull and maximum drawbar pull is the same in high gear. The overall length is 15 ft. 10 $\frac{3}{4}$ in. The height (without stacks) is 7 ft. 10 $\frac{1}{2}$ in. and the width is 9 ft. 11 $\frac{1}{2}$ in. Ground clearance is 16 $\frac{1}{4}$ in. Ground pressure with standard shoes is 8.01 pounds per square inch.

The rugged Detroit Diesel Model 6-110's compact 2-cycle design combines great strength with its simplicity, producing power on every down-stroke. Engine cooling, an important factor in maintaining engine efficiency is four-fold. Engine water flow is controlled by two thermostats which causes the

coolant to by-pass the radiator when the engine is cold. Air from the Roots type blower swirls through intake ports and cools cylinder walls, injector tips and exhaust valves and, at the same time supplies ample air for combustion. Lubricating oil is forced through rifle drilled connecting rods, bathing piston heads in a constant spray and, finally, the fuel oil itself helps cool the engine. The transfer pump delivers an excess of filtered fuel to the unit injectors with the surplus carrying away heat.

The hydraulic torque converter drive gives the operator the equivalent of a transmission with an unlimited number of ratios. This type of drive means larger work capacity allowing the engine to



Cross section of the Allis-Chalmers HD-20 hydraulic torque converter diesel tractor.

deliver higher average horsepower regardless of tractor speed. The converter eliminates shock loads to engine clutches and drives resulting in longer life for the entire power train assembly. Most of the shifting is eliminated thus reducing operator fatigue and increasing production. The torque converter unit automatically selects the right speed to put maximum power to use at every moment of a pass. As a result only two speed ranges forward are required, from 0 to 3 mph. and from 0 to 7 mph. Optional ranges of 0 to 2.5 mph. and 0 to 6 mph. are also available. This smooth working transmission has fewer lever positions, permitting straight-line shifting from low to reverse to speed up bulldozer work. Accurate braking control is assured by

the self energizing brakes which need less pedal pressure and take hold with a firm uniform grip when applied.

Steering is accomplished by hydraulic power. As little as 3 to 5 pounds pressure on the steering levers actuate the valves on the hydraulic system. This gives small tractor maneuverability to this big job.

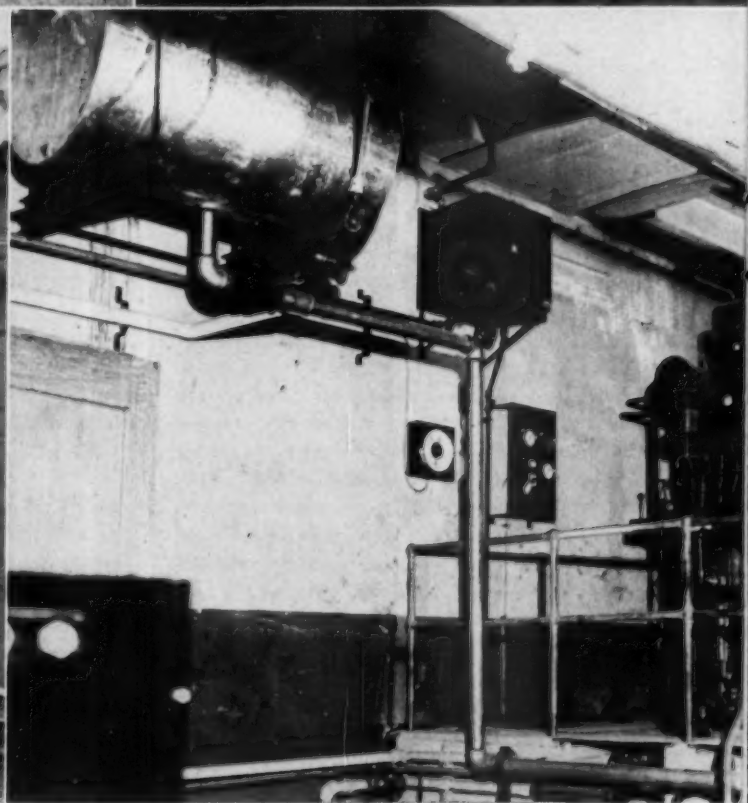
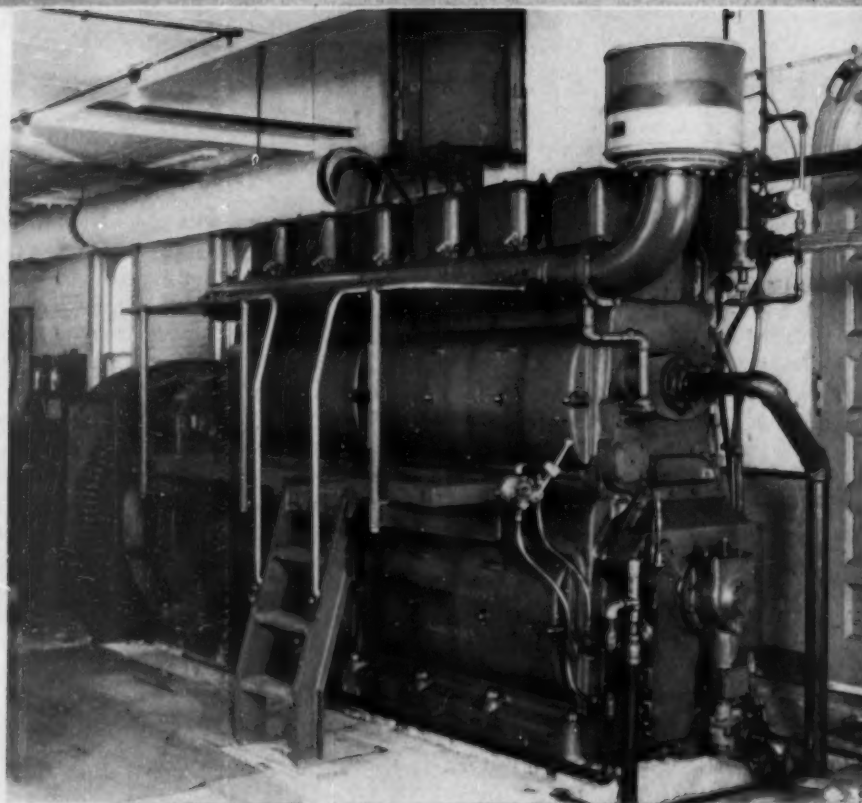
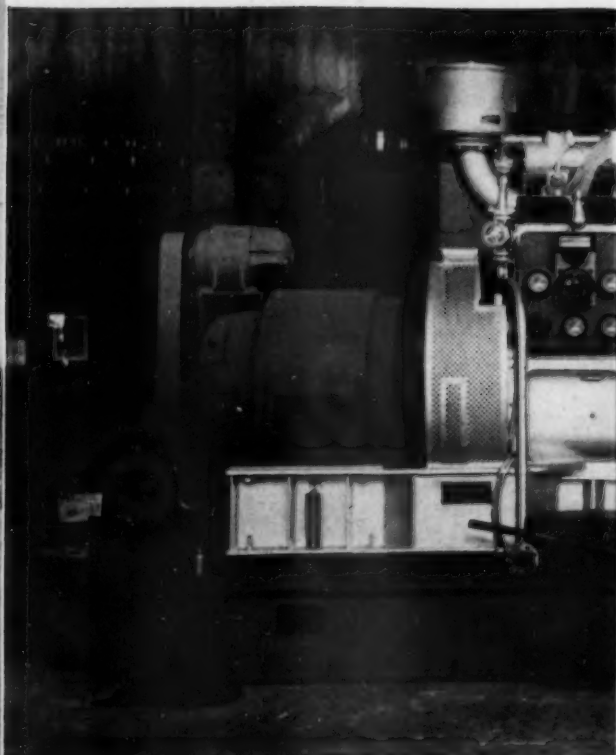
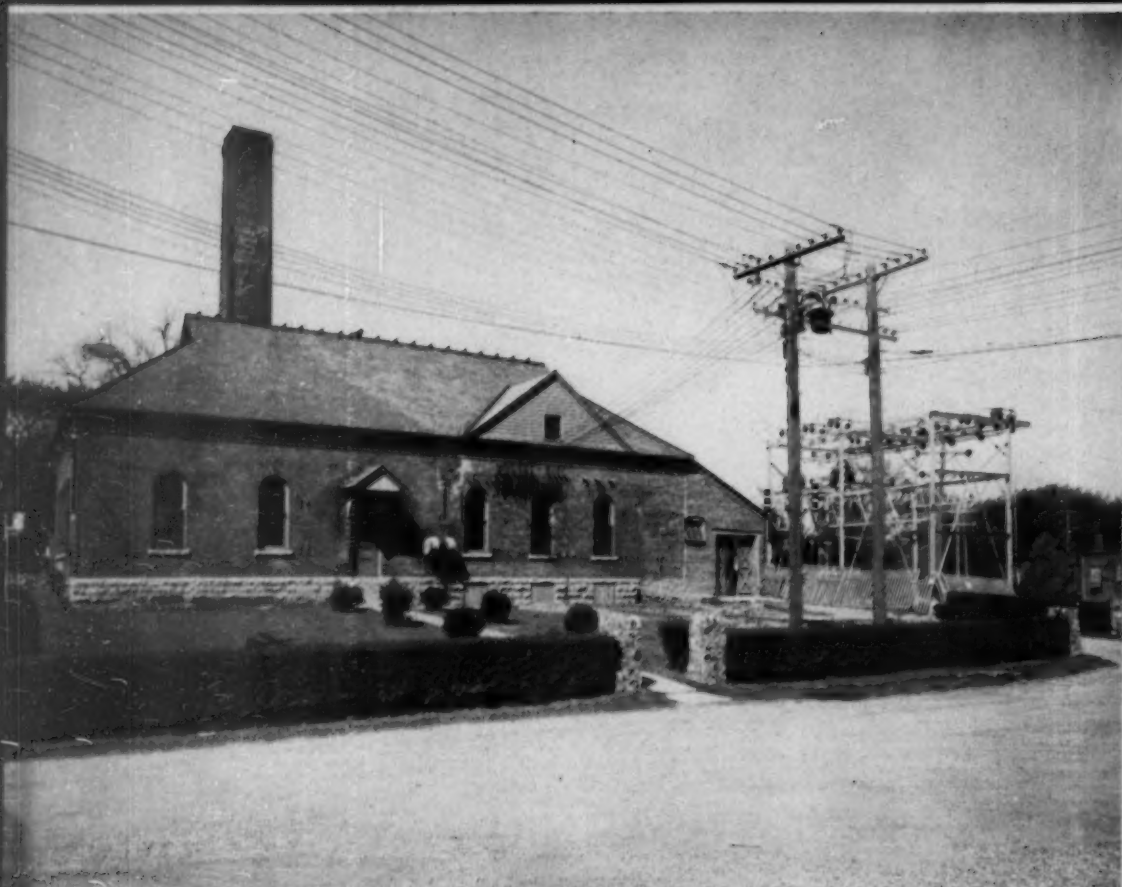
Larger idlers and sprockets and an 84-inch tread provide for better stability, flotation, traction and steady output even on rough terrain, side hill work and mucky bottoms. Idlers and sprockets are positioned to eliminate the rocking action of many

tractors, reducing undue wear of tracks, idlers and sprockets. The wheels, idlers and support rollers rotate freely on tapered roller bearings. Positive seals give protection from dirt and moisture and extend lubrication to 1,000 hours. Clean bottom construction gives the extra clearance necessary on pioneer construction work.

An important feature of the HD 20 is the fact that it is built to fit the practical requirements of the man in the field. Major units are easily accessible and can be removed, repaired or replaced without disturbing adjacent assemblies. This is a time-saving factor providing for minimum downtime for service.

The HD-20 hydraulic torque converter tractors as they carve out a railroad right-of-way to reach the iron ore deposits in Labrador.

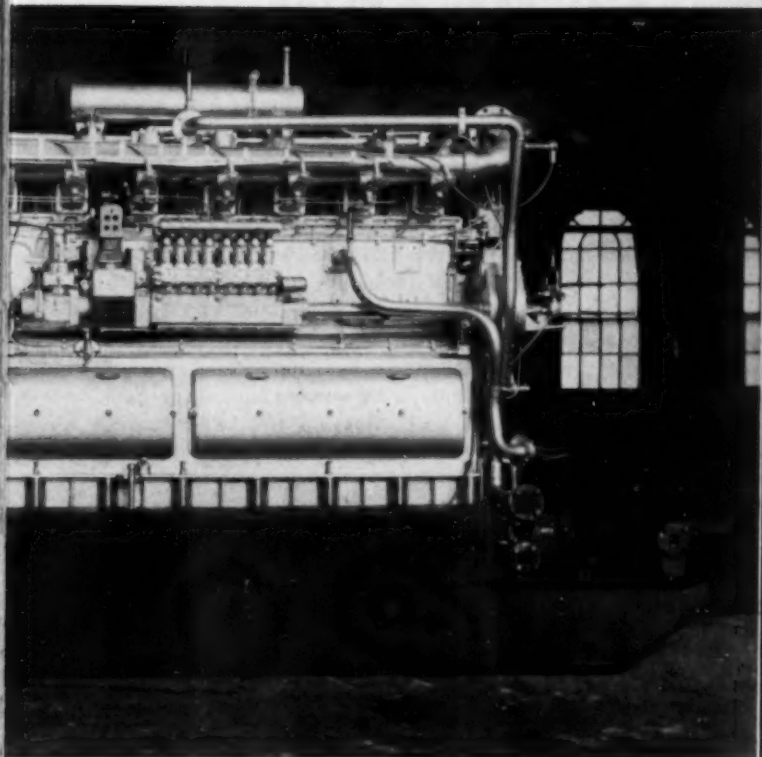




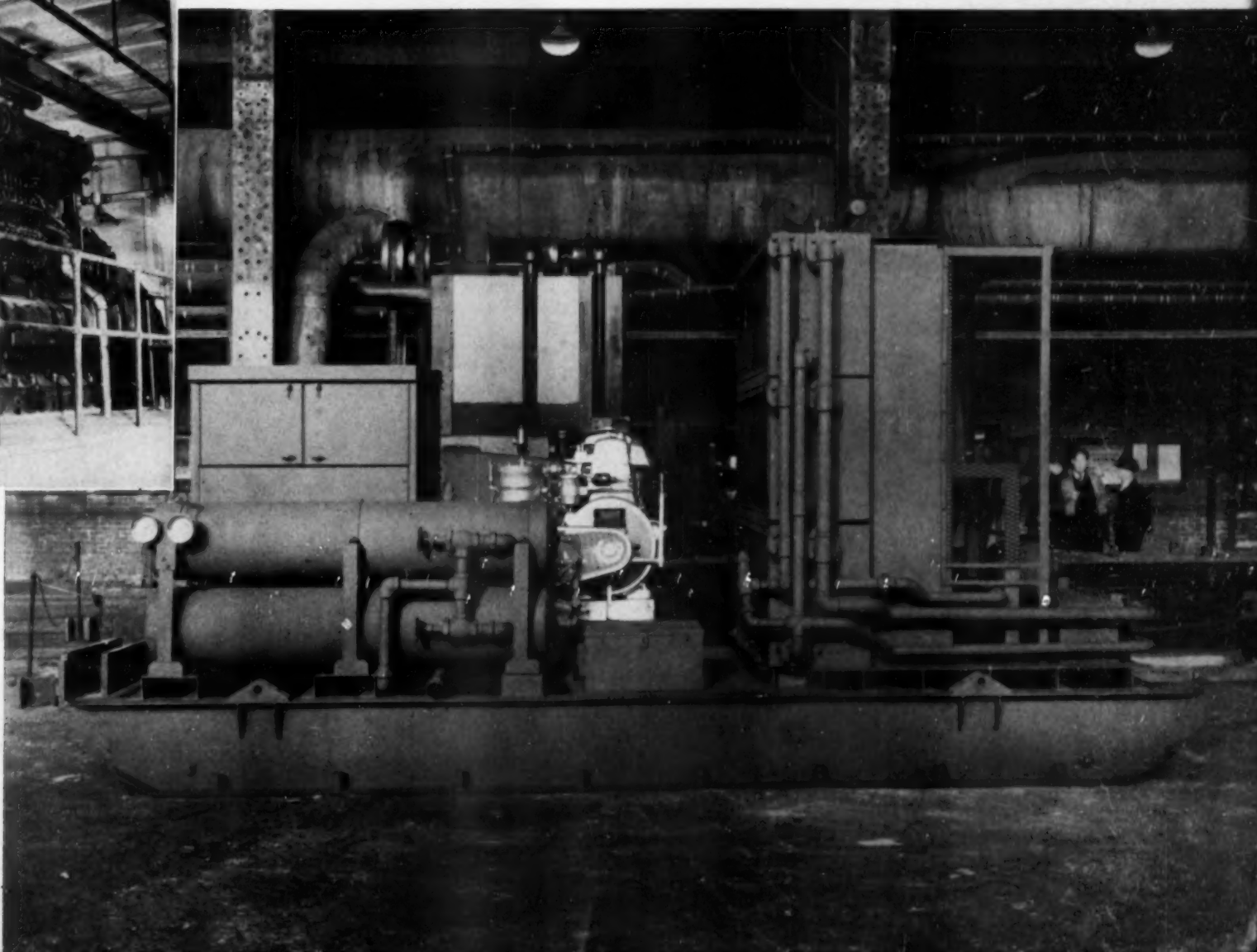
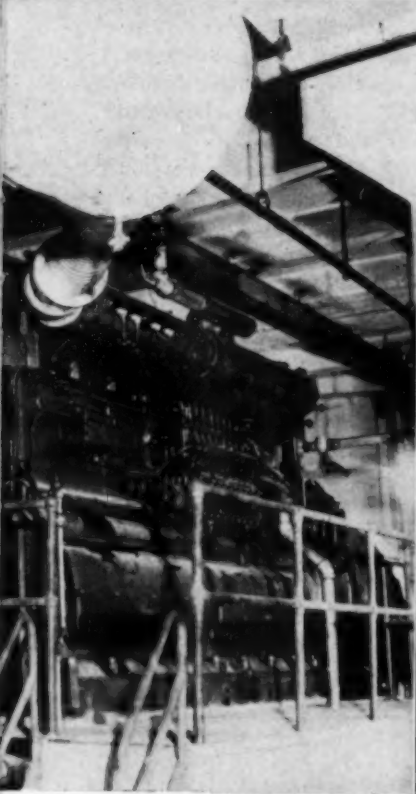
The village of Skaneateles, N. Y. purchases its current from the Utility Company and distributes it to users. The City Fathers developed enough foresight to purchase a 570 kw. Alco emergency diesel generating set to protect its users in case of line failure.

The American Telephone & Telegraph Co. is one of the few large corporations in these United States who have a consistent policy of installing sufficient emergency diesel generating sets to supply full power in case of local or national catastrophes. Illustration shows 780 hp. Alco unit installed in one of the New York Telephone Company's New York City central stations.

A FEW TYPICAL EMERGENCY CIVIL DEFENSE INSTALLATIONS



The U. S. Government has purchased a very substantial number of skid mounted portable emergency diesel generating sets for use not only in this country but throughout the world. These three illustrations show a 400 kw. Alco diesel generating unit with full auxiliary equipment on test in the shop before shipment. Note completeness of auxiliary units. These two skids contain the necessary equipment, fuel and lube oil storage, etc., to go into immediate service when needed.



THE "SOUTHLAND" WINS PRAISE

By DAVID I. DAY

WE stood last summer and later in the fall at the same spot below Keokuk, Iowa, on the Mississippi watching the M.V. *Southland* pushing four heavy barges of petroleum products upstream. The boat was running so smoothly and with such manifest ease that one of the rivermen began to quote the opinions of others. After the conversation had included plaudits from some of the most accurate observers on the upper river, we decided to pay closer attention to this diesel vessel. At all the ports below to Cape Girardeau, the river folk gave towing praise to this Ingalls-built towboat of the late crop of 1951.

When the boat came out she was placed behind old-time single barges while awaiting the completion of her more modern tow. The situation forbade the making of records but it gave a sure-fire indication of her speed and power. Later, handling her modern steel barge fleet, one report from Louisville, Ky., stated: "It is doubtful if another towboat in her size-class can equal the work we have seen from the *Southland* over a period of thirty days." Coming from the yards of the Ingalls Shipbuilding Corp., Decatur, Ala., in November, 1951, for the Southland Towing Co., Louisville, Ky., it was pointed out at her launching that the boat was designed for medium tows and fast speed—the modern principle back of the most profitable river transportation. The boat was built definitely for oil towing against fast currents and under these conditions, as found on the upper Mississippi, the *Southland* has won her best friends and boosters.

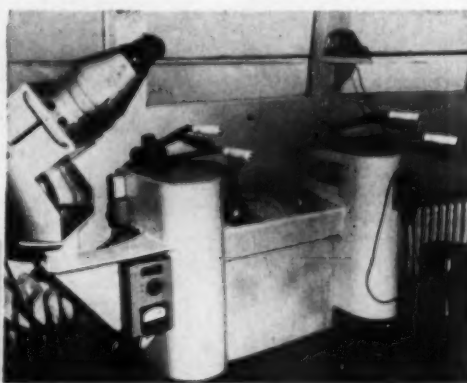
The pilot house of the *Southland*. It features ship-to-shore radio, RCA radar and Edwards intercom telephone system.

The boat is 115 feet in length, 27 feet in beam, 8 feet and 9 inches in depth with a normal draft of 6.6 feet. She is of all-steel construction welded, designed not merely for speed and push but also for appearance. Whether seen from the river shore in full motion or tied to the bank, the craft shows the balance and correct proportions not found in all towboats. We think the banker in Louisville had the right idea. He saw the *Southland* in rough water coming in with heavy oil barges and remarked: "Boats of that type are certain to make river business better." The various departments of the work boat have had no cost spared in making them both attractive in appearance and efficient in service. Without disparagement in any direction, it seems to almost all visitors as well as to men who have worked on the *Southland* that the engine room is the top spot. Certainly, it is one of the neatest and best arranged engine rooms to be found on the inland waterways.

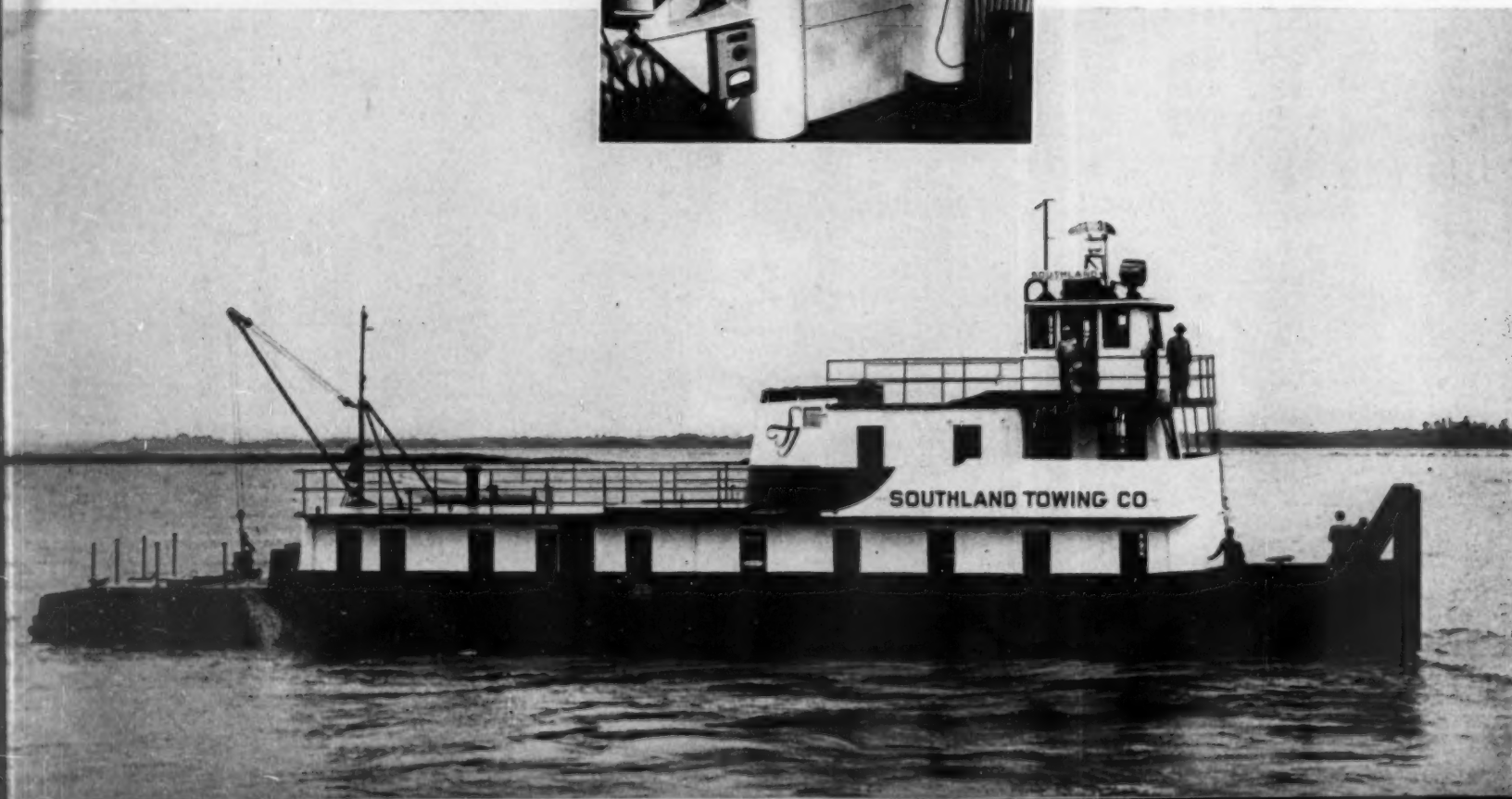
Rated at 1800 hp. at 400 rpm., the propulsion force is from twin Superior diesel engines from the National Supply Co., Springfield, Ohio. They are of the famed Model 60, an engine making its reputation on numerous boats on all sorts of river. It is distinguished particularly for its behavior under adverse operating conditions. This model is a ver-

tical type, 4-cycle, cold starting unit, with mechanical injection and cylinders cast enbloc. It is most definitely a single-purpose unit. The *Southland's* engines are entirely enclosed to keep out the dust and keep in the oil. It was definitely in the builder's mind to give not only real service but easy accessibility to all working parts should anything go wrong. The governor and the engine controls are on the forward end of the unit, just under the instrument board. This engine can be checked, feature by feature, bedplate, crankshaft, cylinder block and linings, pistons, and all else with little to criticize. Many students of diesel engines like particularly the fuel system idea used on the engines propelling this efficient towboat. This system is of the solid injection type with individual pump for each cylinder, the pumps mounted immediately over the camshafts. The injection pumps are connected with the spray nozzles by rather short tubes.

These nozzles are mounted vertically in the center of the combustion chamber. An engine-driven fuel service pump keeps correct pressure on the injection pumps and in the line is placed a duplex fuel filter. The nozzles and pumps can be easily reached for servicing. The whole fuel system in the words of one engineer is "designed to give plenty of service with very little servicing trouble." The *Southland's* engine room is simply one of those you must see to fully appreciate. The lighting, the ventilation, the neatness, all give flavor and atmosphere to a place arranged for the one job of powering a commercial work boat. It is hard to determine



The *Southland* under way. She is 115 ft. long, has a beam of 27 ft. and is 8 ft. 9 in. in depth with a normal draft of 6.6 ft.



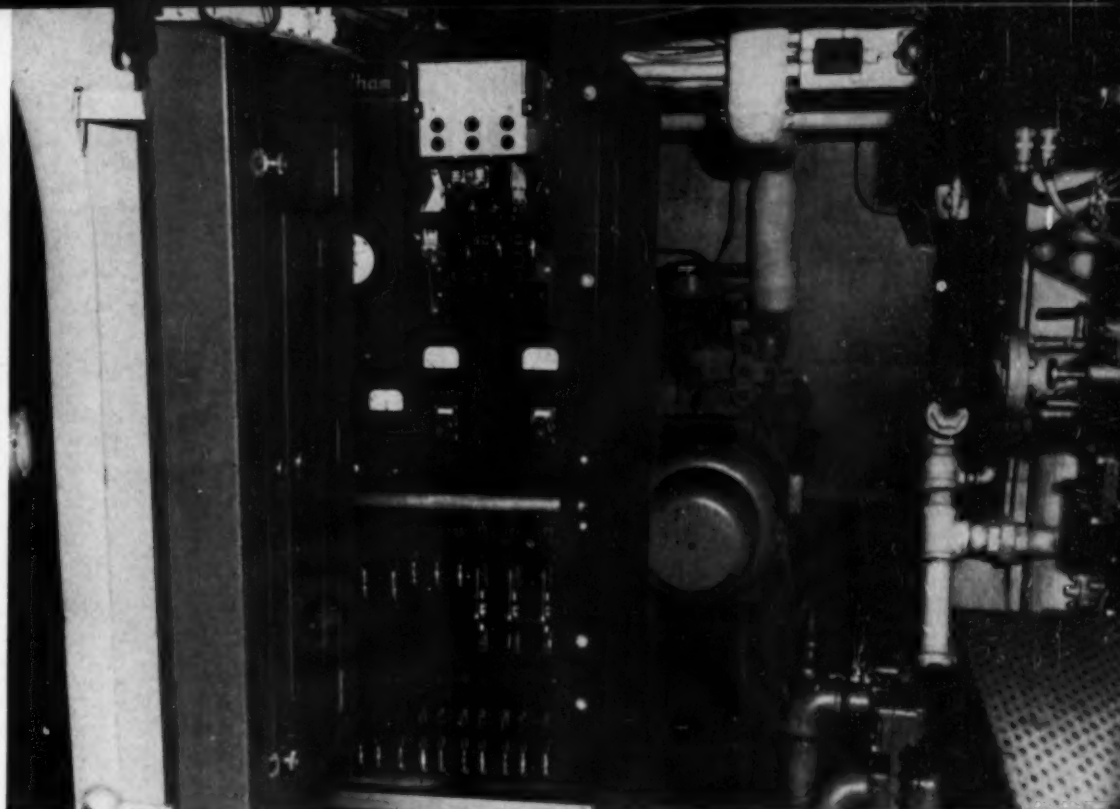
where to stand to get the most pleasing view. Perhaps, it is just as well to stand on the starboard side where you get a fine view of the switchboard and generator. A moment later, you believe a better picture is obtainable from the port side where the engine alarm panel shows up. No matter where you look or where you stand in the engine room, the impression is pleasing.

You will note in the photograph of the boat that she possesses a typical Ingalls bow. You cannot see but it is there—the tank arrangement in the hull to hold 25,000 gallons of diesel fuel. There are water tanks also there to hold 10,000 gallons with drinking water tanks holding 2000 gallons. Universally admired along the shores of the lower Ohio and the upper Mississippi is the deckhouse on the boat, adding its share to the moderately streamlined appearance. This seems to show to better advantage when the boat is under full speed ahead. On the main deck, forward of the engine room, you find the comfortable and pleasing quarters for the crew of eight. Aft of the engine room are the steward's quarters, the galley, the messroom, and a lounge room for the men.

On the texas deck we find the quarters of the officers of the towboat. They are commodious quarters, too, with all modern conveniences. A lounge is adjacent. All are finished with marine veneer and fully insulated employing Johns-Manville mineral wood. No boat of the same size on the waterways is more cheerful or livable. When Ingalls built it, the idea was to utilize as nearly every square inch of space as possible but in no case to deprive the officers and men of comfort after the day's work. The Vickers hydraulic steering system is used to operate the two steering and the four flanking rudders separately. The capstan is from Schoellhorn-Albrecht, the generator sets are from Caterpillar, the water pressure sets are from Fairbanks, Morse & Company while the modern and efficient fire pump is a product of Allis-Chalmers.

Allis-Chalmers also made the bilge and ballast pumps while the fuel oil transfer pumps are from Roper. There is a Quincy air compressor giving complete satisfaction on the *Southland* while fire protection aboard the boat comes from four convenient fire extinguishers. Two are of the CO-2 type. The other two are foam-type units. Atop the white pilot house on this boat are two Carlisle-Finch searchlights. The navigation lights came from the Perkins Marine Light people. Additional equipment includes a Clark-Cooper air horn, a butane Magic Chef stove, a 20-cubic feet capacity electric refrigerator, two Westinghouse electric water coolers, and other minor items.

No one can be said truly to have visited the *Southland* unless he spent a little time in the comfortable roomy wide-visioned pilot house. From no other place can one get a nicer view of the willows along the river shores to say nothing of the passing boats and the towns from time to time. The pilot house has everything up to the luxury point—the ship-to-shore radio, the RCA radar, and the Edwards inter-communications telephone installation. The towboat was built to really stand for many years the chemical effects of river water. The



Starboard side main engine room looking forward showing a portion of the switchboard and generator.

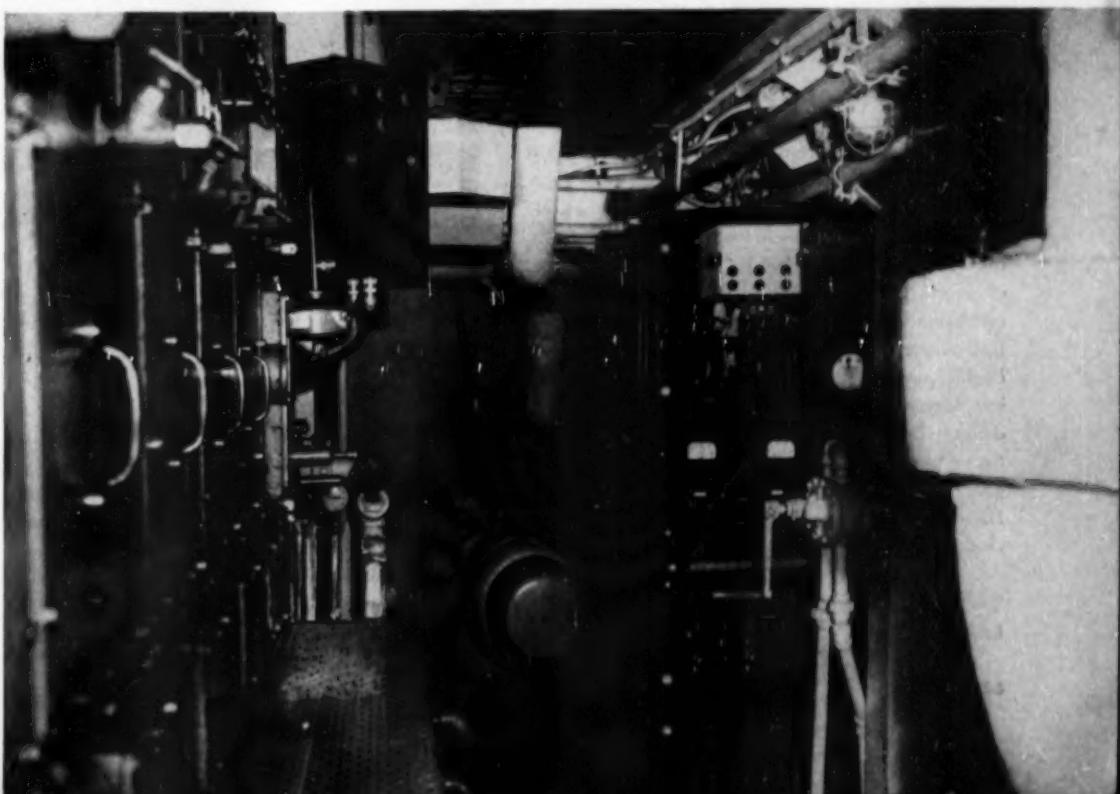
heavily welded hull bottom, the sideplates, and other parts are of $\frac{5}{8}$ inch thickness. The deck plating is $\frac{1}{2}$ of an inch thick. This is the thickness also of the longitudinal and transverse framing. Evidently the shipyard people had in mind the long service given by great towboats like the *St. Paul Socony* when the work went on to the completion of the *Southland*.

The name itself is regarded by older river captains, pilots, and engineers as a lucky one. They recall the popularity of a steamer of this name once plying in and out of Evansville, Ind., on the Ohio. Especially are tales told of the lucky whistle which on various packets of the old, old days had been heard by the people there for 75 years. Down in the lower channels of the Father of Waters, the

boatmen recall another *Southland* there at work, a diesel hawser tug, which coincidentally also was built in the vicinity of Decatur, Ala., some years ago.

Capt. Clarence L. Ritchie, Paducah, Ky., is master of the M.V. *Southland* which since last July has been operating between the Gulf Coast and the upper Mississippi River with some trips up the Illinois Waterway into Chicago. With the boat's new integrated barges she has made fine steady records although for much of the time the river has been rather low. Capt. Harold Howe is relief Master and Preston Brown, Henderson, Ky., is Chief Engineer and has been since the boat set to work. Most of the oil towing done has been for the Ash Petroleum Co., with headquarters at Shelbyville, Ind.

Port side of main engine room looking forward showing portion of switchboard, generator and engine alarm panel.



EMERGENCY DIESEL SETS FOR PHONE CO.



TELEPHONE service throughout the country has become an important factor in our daily living. Business depends on telephone service as an essential tool of industry. Telephones in our homes are considered a necessity. In emergencies telephone service is particularly important in securing help and assistance. In order to provide the kind of service most subscribers take for granted, it has been necessary to develop and produce equipment and facilities capable of handling these emergencies.

Several years ago, Bell Telephone Laboratories undertook a program which would provide a dependable power source during long periods of commercial power failure. A few hours' service is provided by central office batteries but commercial power failure beyond these few hours would render the office inoperative. To carry out this program the engineers at Bell Telephone Laboratories developed standby generator sets for installation in central offices. These first standby sets were gasoline engine powered. However, gasoline engine driven sets proved impractical in some installations, as the dangers from fire and explosion were too great in heavy populated business areas. Then too, larger generator sets were needed for many exchanges. Diesel generator sets proved to be the next logical step in the standby equipment program.

To power a standby generator set in the 150-200 kw. range, the engineers at Bell Laboratories

needed a compact, lightweight, heavy-duty diesel engine which would produce approximately 500 horsepower. Previous experience with smaller, 20-kw. automatically operated, standby diesel generator sets used in connection with coast-to-coast TV and radio relay, helped solve the space and weight requirements. These Hercules dieselized radio-relay standby sets proved highly satisfactory and their compact design permitted installation in limited spaces. For an alternator in the 150-200 kw. range the Hercules diesel engine, Model DNX-V8DTS was selected after thorough investigation and arranged to drive a 170 kw. alternator. This Vee-type,

local power is restored the automatic control starts a timer which continues the office load on engine power for a predetermined time to be sure the power restoration is permanent. At the end of that time the load is transferred back to the local power supply and the engine stops.

This particular application is one of the first fully automatic diesel sets of this size. (Previously gasoline and small diesel sets have been equipped for automatic operation.) Here again the Hercules Model DNX-V8DTS fulfilled the specifications of the Bell Telephone Laboratories engineers.

A CIVIL DEFENSE INSTALLATION

8 cylinder, diesel engine develops 295 hp. at 1200 rpm., and its compact design and lightweight, heavy-duty construction meets the weight and space requirements set forth by the Bell Telephone engineers.

In addition to the weight and space problems, the engineers at Bell Telephone Laboratories were confronted with technical problems of making this 170-kw. generator set fully automatic in its operation. In event of local power failure, a switch is activated which starts the diesel engine and then cuts the generator set into the power supply line for the telephone exchange. Further, as soon as

This Hercules dieselized standby equipment will not only be used to power the telephone equipment in emergencies but also in some cases will be used to operate lights, elevators, pumps and similar telephone exchange building services during emergencies. The 170-kw. might also be expected to provide exchange service for some 45,000 subscribers during periods of power failure. For exchanges of larger capacities, as many as three Hercules diesel powered alternator sets will operate in parallel. A number of telephone exchanges are now being equipped with this Hercules diesel equipment as their economical and dependable power provides efficient service in any emergency.

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HEART OF INDUSTRY'S LIFE LINES



Pacific Towboats' harbor tug *Fir*, powered by a Model 4-51 diesel, at work near Everett, Washington.

GM DETROIT DIESEL'S NEW MODEL 4-51

By CHAS. F. A. MANN

AS usual, when a diesel engine builder wants to find out whether or not he's got a brilliant performer or a dud in his newest diesel brainchild, he picks the one region where diesel pioneered so many times 40 years ago, that he can get his answer quick—far ahead of eastern "release dates" to the dealers and the press. The Pacific Northwest is where diesel speedily wins its spurs or is scrapped.

So, following the traditional pattern, Detroit Diesel Division of General Motors back in early summer of 1952, hauled its brilliant, new, compact loop-scavenged little 4-51 out to Puget Sound and put them to work in a tugboat and a prosperous little portable sawmill. Pacific Towboat of Everett replaced another older diesel of 317 cu. in. displacement, for a tiny Everett Harbor tug, the *Fir*, which earns its keep shifting log rafts for Everett lumber and pulp mills. This was in September and as we close for press, the owners are tickled pink with their compact little 85 hp. diesel that takes no more room in the small hull than a gas engine of

five years ago did. Pacific Towboat Company operates eight other General Motors diesels in its fleet of towboats including a Model 6-110 in the tug *Sea Duke*. It enjoys the distinction of having installed the first General Motors Diesel Series 71 on Puget Sound, the 6-71 in the *Lorens* in 1939.

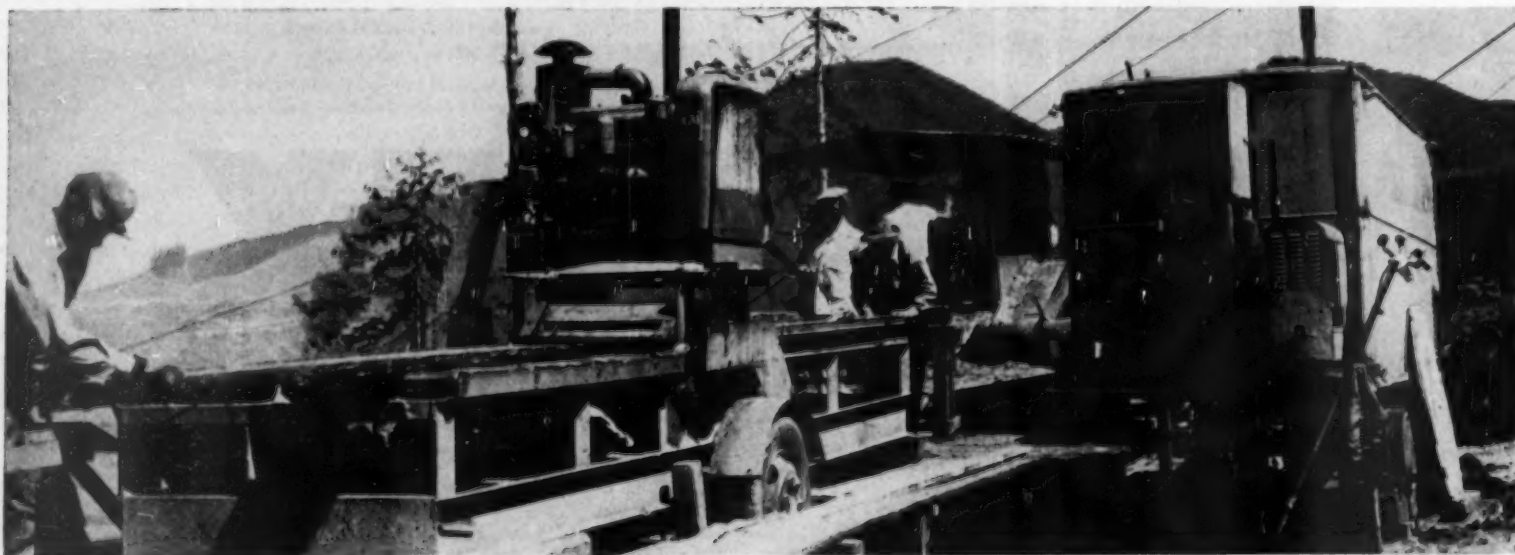
The tug *Fir* with its new 4-51 GM diesel is a typical midget Puget Sound harbor tug. Its power plant operates with a 3:1 reduction gear and swings a 22 x 24 in. propeller with extremely wide blades. Normally it operates at 2000 rpm. but will turn up to 2450 at top speed running free.

All GM Detroit diesels are handled in the Northwest by Evans Engine & Equipment Co., with Father and Son Evans covering a tremendous field for small and medium diesel application on land and sea. Chuck Evans was in charge of the Pacific Towboat marine job as well as the first sawmill use installation. This is the Cotton Bros. portable sawmill job for work near Tacoma in South Cen-

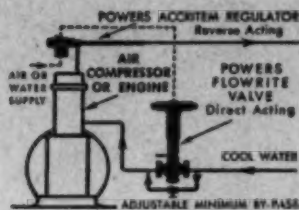
tral Pierce County. Headquartered at Spanaway, Wash., south of Tacoma, Cotton Bros. are extensive truck loggers and operate a small portable sawmill outfit turning out 20,000 feet of rough lumber daily (8 hour shift). Their portable sawmill took delivery in July of a 4-51 GM diesel to run a 4 in., 3-saw edger unit on the portable mill. The head saw of this mill carries a larger 6-71 GM diesel and the 4-51 GM diesel replaces a small gas engine.

So far the 4-51 reduced fuel consumption from slightly over 3 gallons of gasoline per hour to 1.65 gallons of diesel fuel per hour, with more pulling power in heavy cuts. Since going into operation all that had to be done servicewise was to change the fuel and lube filter elements. Thus General Motors did it again, by pre-testing their newest diesel offspring way out in the rough and ready Northwest where a diesel either performs or it goes back to the manufacturer between Friday night shutdown and Monday startup, and no questions asked (or answered!).

The Cotton Bros. portable sawmill working near Tacoma, Washington. In the change-over from gasoline to the Model 4-51 fuel consumption was reduced from over 3 gallons of gasoline to 1.65 gallons of diesel fuel per hour.

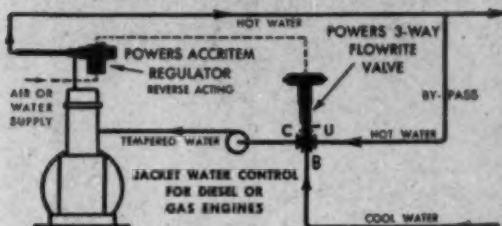


Used in Wolverine Electric Cooperative, Hersey, Mich.

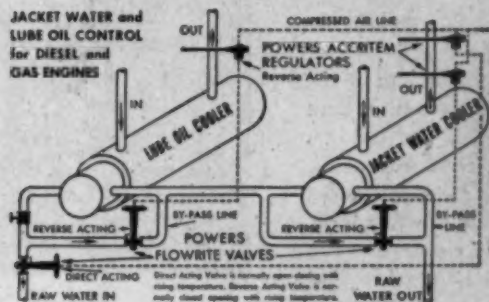


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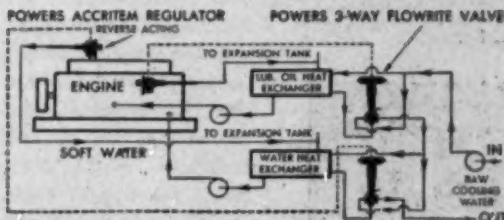


Only a few of many applications are shown here.



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BALDWIN, KANSAS

Carries 71% of Production. One 900-hp. Nordberg Unit in a Five Engine Plant Operates Both as Duafuel and as Oil Engine, Cuts Fuel Costs \$6,293 in First Full Year.

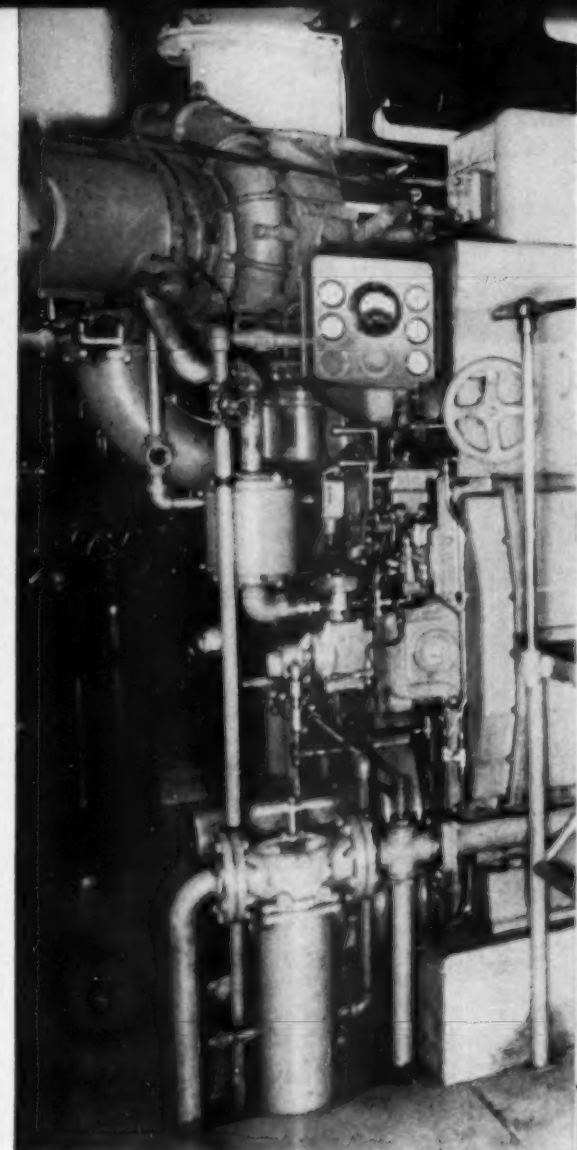
By LEONARD WHITTED*

IN a power plant serving a small city, the addition of one new generating unit can effect tremendous changes in operations and operating costs. For example, the installation of a 900 hp. Nordberg duafuel engine in the Baldwin, Kansas municipal plant in the fall of 1950 resulted in a reduction of 34 per cent in total plant fuel costs in the first full year of operation. In this four engine power plant, the new unit generated 71 per cent of total plant output. This progressive Kansas community of 1,300 population, home of Baker University, oldest four year college in the state, has had long experience with internal combustion prime movers in its municipal utility. The city first provided electric power for its citizens in 1906, utilizing a spark-ignition natural gas engine. In 1917, the first of the units still in service was installed. This was a 165 hp. four-cycle, Busch-Sulzer air-injection diesel. Five years later a 180 hp. diesel of the same type was added to the plant. In 1938, the city purchased a 250 hp. Busch-Sulzer, again an air-injection diesel engine.

In common with other similar communities, Baldwin experienced sharp and rapid growth in the demand for electricity in the years following World War II. Here there was an increase in the popularity of electric stoves, boosting the residential consumption which constitutes the major part of the load. There was more commercial lighting and air conditioning. There was more activity in such local industries as the creamery and woodworking factory. To meet the growing demand, Baldwin installed in 1946, a six cylinder, mechanical injection, Busch-Sulzer diesel rated at 540 hp. at 360 rpm. But load development continued at so rapid a rate that soon firm power was again below requirements, and it was impossible to carry the load without the newest engine. Again the city recognized the need for plant expansion to provide ade-

quate reserve power to insure unfailing service. It was decided to purchase a unit large enough to carry the existing peak load with some margin for load growth. At the same time, it was logical to take advantage of modern duafuel design and utilize the available supply of cheap natural gas. The engine was a four-cycle, supercharged Nordberg duafuel, with six cylinders of 13 in. bore and 16½ in. stroke, rated at 900 hp. at 450 rpm. This engine went into regular service in the fall of 1950 and promptly assumed its position as the plant's top prime mover in both production and economy. In the 12-month period from Nov. 1950 through Oct., 1951, the engine was in operation 5,205 hours and produced 1,559,800 kwh., 70 per cent of the plant's total generation.

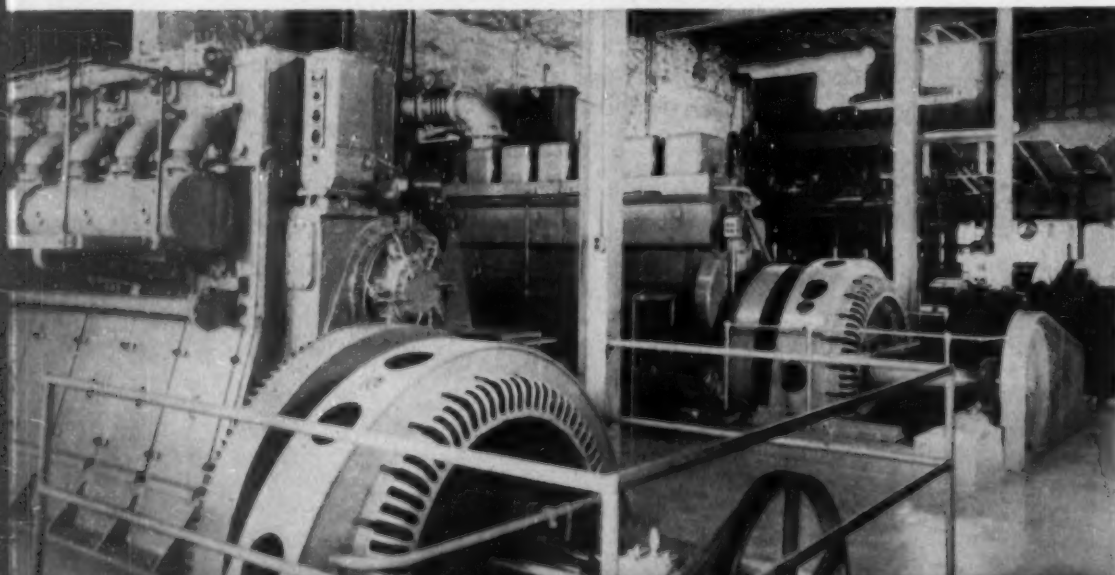
Flexibility and economy in fuel consumption are major advantages of the duafuel engine, advantages fully utilized in the Baldwin plant. Most of the time, the engine runs on natural gas with a small quantity of diesel oil as pilot fuel, but when gas pressure drops, the engine switches instantly to fuel oil. At all times, the unit runs on the efficient diesel cycle. In the year (Aug. 1949 through July 1950) before installation of the duafuel engine, the plant produced 1,965,100 kwh. on 171,910 gal. of fuel oil. At the city's current price of 10 cents a gal., this meant a fuel cost of 8.70 mills per kwh. With the duafuel unit in service for a full year, the total plant's fuel consumption consisted of 95,886 gal. of oil at a cost of \$9,588.60 and 17,054 mcf. of natural gas costing \$2,924.11. With production at 2,179,859 kwh., this meant that the total plant's cost per kwh. dropped to 5.74 mills. Compared with the previous cost of 8.70 mills, this represented a saving of 2.96 mills per kwh., a total of \$6,452.58 for the year. The Nordberg engine itself, operating mostly as a duafuel but part of the time on oil, produced its 1,559,800 kwh. on 41,012 gal. of oil and 17,054 mcf. of gas at an average cost of 4.49

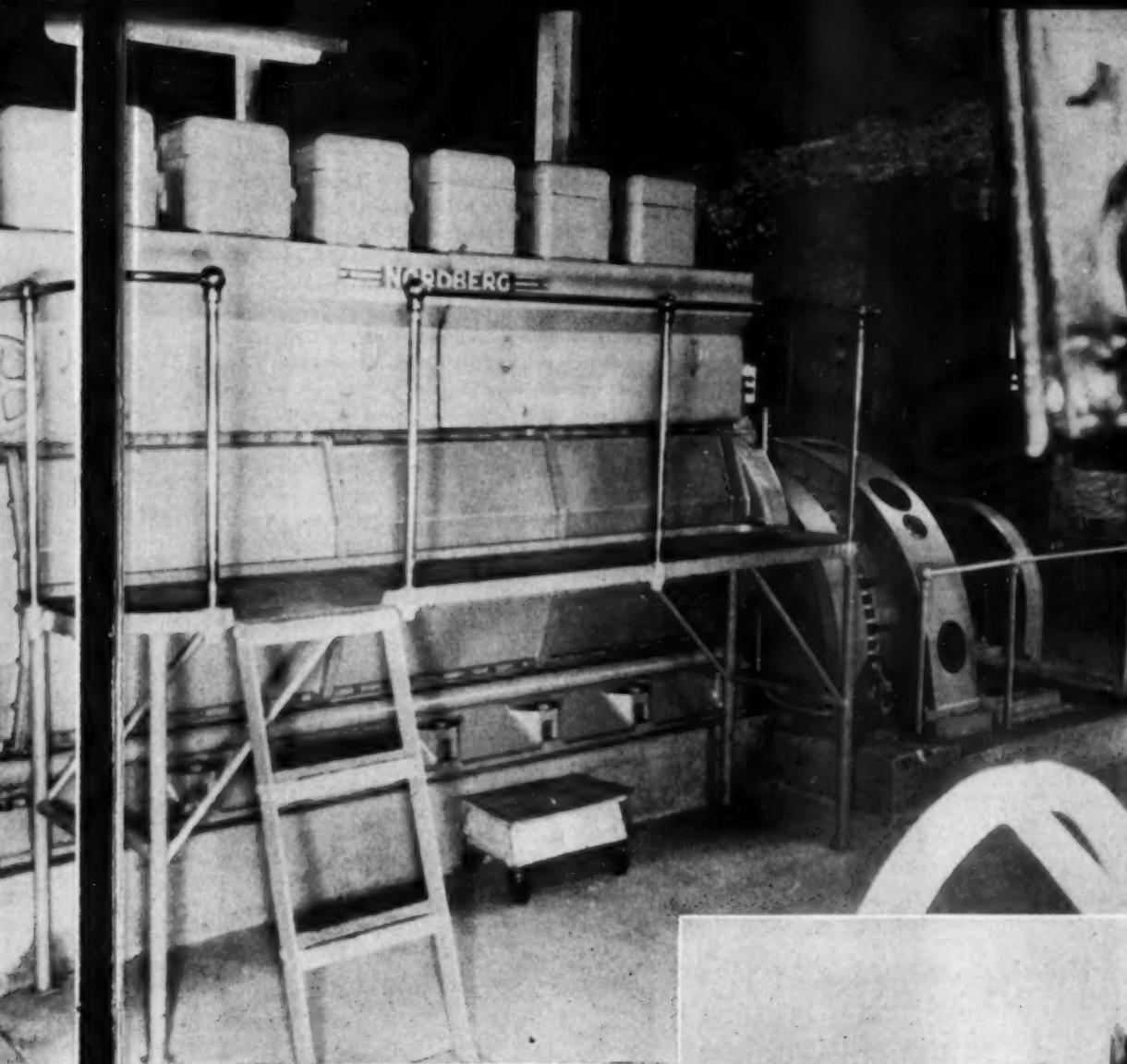


mills per kwh. A typical month such as October 1951 when the engine ran wholly as a duafuel shows what economies can be achieved. In this month, with engine production at 132,500 kwh. on 977 gal. of oil and 1,810 mcf. of gas, the costs per kwh. were: Natural gas, 2.70 mills; Pilot oil, 0.73 mills; Total fuel, 3.43 mills.

As yet, load conditions do not permit operation of the duafuel unit at peak efficiency. Peak load reaches 550 kw. on winter evenings, a good load for the engine. But on winter nights, the load drops as low as 120 kw. Usually one of the smaller engines is used to carry the valley load, but it has been found profitable to run the duafuel even at relatively inefficient load levels. Thus, the average operating engine load factor at which the cost figures above were cited was no better than 50 per cent. All reports indicate that lubricating oil consumption on the duafuel engine has been extremely low. A detergent oil is circulated through the engine under pressure by a built-in pump and this circuit includes a shell-and-tube oil cooler. Whenever the engine is in operation, a small motor-driven pump draws lubricating oil from the crankcase, puts it through a cellulose-type filter and returns it to the crankcase. Filter elements were changed for the first time after 10 months and at that time, says Mr. Whitted, the oil was in good condition and the crankcase was clean as new. The entire plant is served by a single closed cooling water system. A pair of motor-

This view shows the four engines in the plant, (l to r) a 540 hp. Busch-Sulzer diesel, a 900 hp. Nordberg Duafuel and two air-injection Busch-Sulzer engines rated at 250 hp. and 180 hp. Note Woodward governors.





The Nordberg Duafuel is a six cylinder, 13 in. x 16½ in., four-cycle Super-charged engine rated at 900 hp. at 450 rpm. Operating on natural gas this unit produces a kwh. for a fuel cost of 3.43 mills. Note Alnor pyrometer and Nugent filters.

driven centrifugal pumps circulate soft water through the engine jackets and through the coils of an induced draft cooling tower. A thermostatic valve on the engine maintains the desired temperature by by-passing water around the tower. Two motor-driven centrifugal pumps provide raw water for the tower sprays. For make-up in the jacket system, the plant uses city water treated in a zeolite softener.

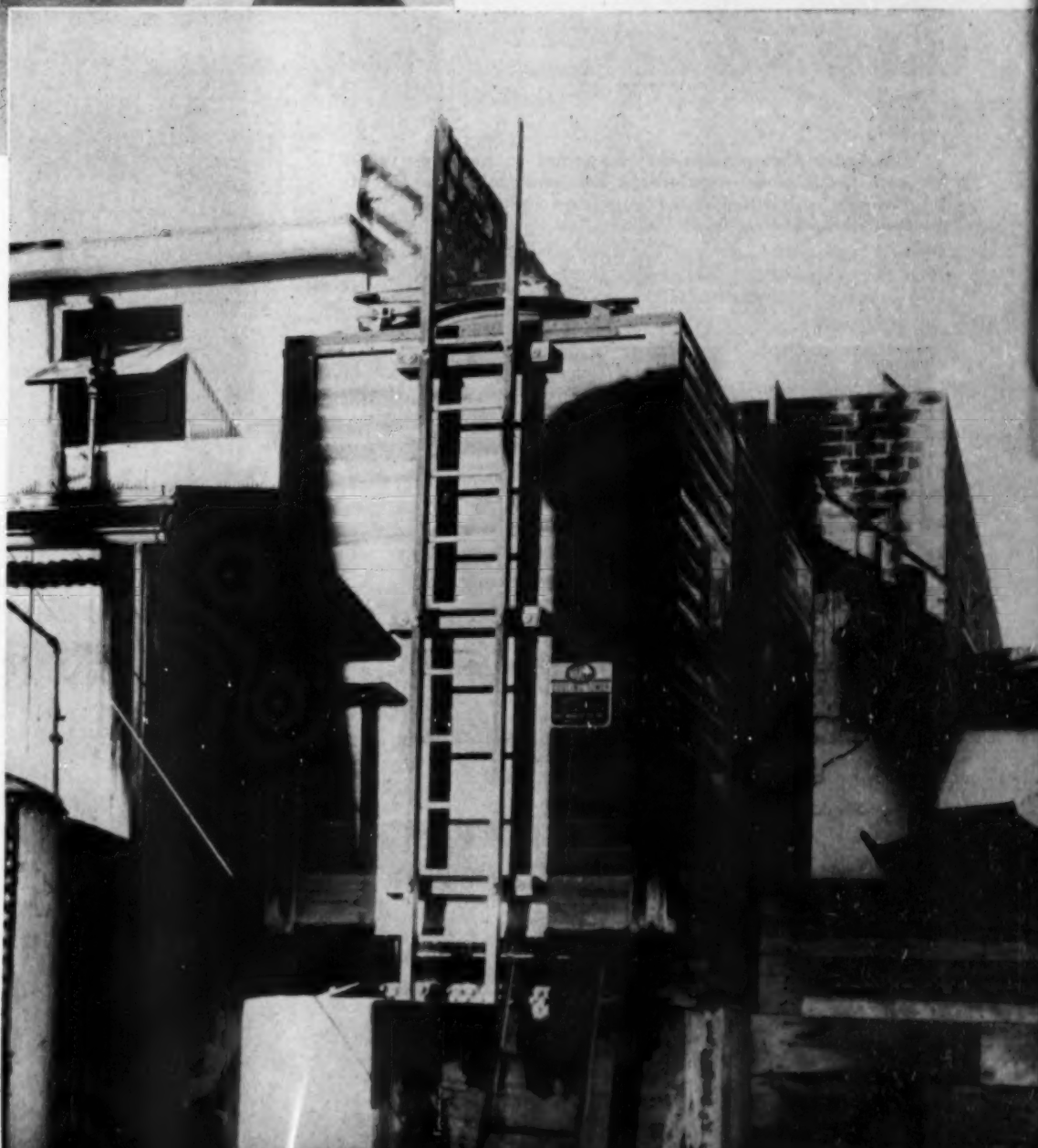
The Nordberg engine is arranged for convenient operation with an exhaust pyrometer and pressure and temperature gauges mounted on the operating end of the unit. In addition, safety devices protect the engine. An alarm sounds if water temperature goes too high or lube oil pressure drops too low. If lube or pilot oil pressure fails, the gas is cut off automatically. If gas pressure fails, the engine switches to fuel oil. The Baldwin plant is operated by the author under the policy supervision of Mayor C. V. Reeves and the Council Committee on Light and Water which includes Chairman Merlin G. Ford, Earl T. Black and George L. Rhine. Baldwin is a small town but closely attuned to the main currents of Kansas life. Just an hour's drive from Kansas City and equally close to Topeka, this community has its quota of

commuters who work in big city industry and live in small town comfort. Baldwin's attractiveness to residents and to local business includes excellent educational facilities, good rail, bus and truck transportation and, high on the list, dependable utilities. With its duafuel engine in service, the city can count on unfailing electric light and power and look forward to greater municipal profits and lower power costs.

List of Equipment

Engine—One 900 hp., six cylinder, 13 in. x 16½ in., 450 rpm., supercharged duafuel engine.
 Nordberg Manufacturing Company.
 Generator—General Electric.
 Fuel-meter—Neptune Meter.
 Gas—Cities Service Gas Co.
 Gas meter—American Meter.
 Gas regulator—Emco. Pittsburgh Equitable Meter.
 Lube oil—Standard HD. Standard Oil.
 Lube filter—Hilco Hyflow, Hilliard.
 Cooling tower—Marley.
 Oil cooler—Ross.
 Air filter—Air-Maze.
 Snubber—Burgess-Manning.
 Pyrometer—Alnor.
 Governor—Woodward.

The entire Baldwin plant is served by a Marley induced-draft cooling tower.



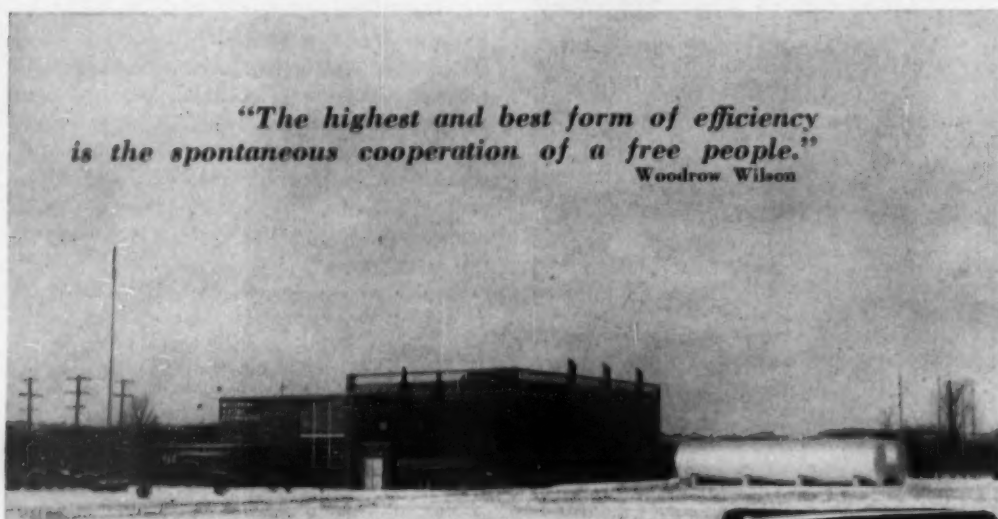
Cooper-Bessemer Adds to Houston Office



Morris Evans

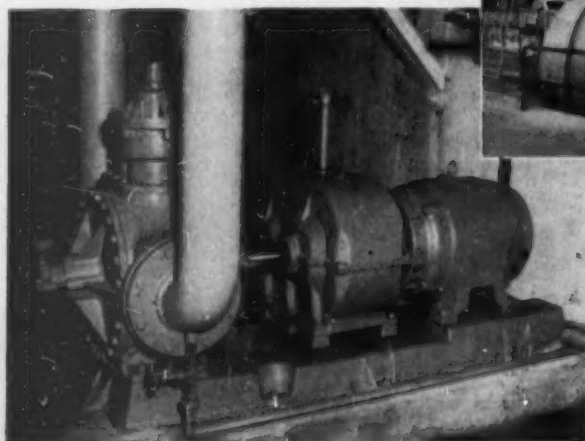
The appointment of Morris Evans to Cooper-Bessemer's regional office at Houston, Texas, has been announced by Stanley E. Johnson, vice president in charge of sales for The Cooper-Bessemer Corporation. Working under the direction of Robert Dale, branch manager, Mr. Evans will devote his efforts to engineering compressor installations for refinery operations. A graduate of Vanderbilt and Virginia Military Institute, Mr.

Evans has received a degree of Bachelor of Engineering in Mechanical Engineering. Since graduation he has been undergoing intensive factory training at Cooper-Bessemer plants in Mount Vernon, Ohio, and Grove City, Pennsylvania, with special attention to compressor operations in refinery work. For the present he will concentrate his field activities to southeastern sector of Texas. "The assignment of Mr. Evans to Cooper-Bessemer's field operations is an additional step in attaining even closer contact between the factory and the ultimate user of compressor equipment," Mr. Johnson explains. "Mr. Evans' comprehensive factory training plus his previous refinery experience will provide invaluable assistance to petroleum engineers in the Texas area."



"The highest and best form of efficiency is the spontaneous cooperation of a free people."
Woodrow Wilson

Blackmer Pump Company is proud to be represented with those whose equipment has contributed to the efficiency which has won recognition for Wolverine Electric Co-operative, Inc.



Efficient lubrication
for the Fairbanks-Morse
Diesel engines is assured
with self-adjusting for wear
Blackmer Rotary Pumps.

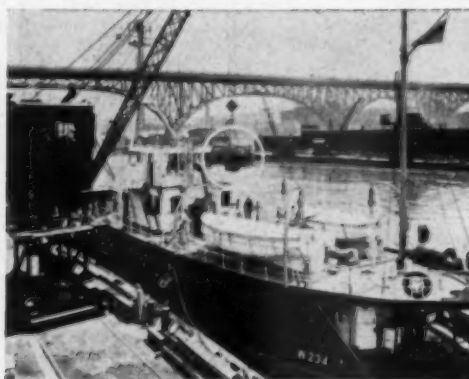
Write for
Bulletin 307
"Facts About
Rotary Pumps."

BLACKMER PUMPS
For Liquid Materials Handling
INDUSTRIAL PUMPS • TRUCK PUMPS
HAND PUMPS
BLACKMER PUMP CO., GRAND RAPIDS, MICH. Since 1904

Named Detroit Sales Engineer

John W. Freund, sales engineer of the Piston Ring Department of Koppers Company, Inc., since 1951, has been named Detroit sales engineer for the company's entire Metal Products Division, J. L. Tunstead, division sales manager, announced. He will report to the division's sales office in Chicago. In his new post, Mr. Freund will be sales representative for American Hammered Industrial Piston Rings, Koppers-Elex Electrostatic Precipitators, gas apparatus and for special contracting work, all produced in Koppers' two Baltimore plants. He joined Koppers in 1948 and did research on stress analysis of piston rings. In 1950, he was appointed an engineer in Technical Service, working with aircraft rings. A year later, he was promoted to sales engineer, Piston Ring Department. A graduate of the Baltimore Polytechnic Institute, Mr. Freund also attended Johns Hopkins University.

Repowered USCG Cutter



The extreme compactness of the *Maple's* new propulsion units is shown in the photo as one of the two GM units is lowered into place.

Recently repowered with a pair of Tandem Twin-Six Diesel engines the United States Coast Guard cutter *Maple* has reported back on duty near Ogdensburg, New York with a top speed increase of nearly three miles per hour. The craft has been assigned to handle buoys and other navigational aids in Lake Ontario and in the St. Lawrence River. She will also be available for search and rescue work 24 hours a day.

The 330-ton ship was built in 1939 by the Marine Iron and Shipbuilding Company of Duluth, Minnesota. She is of steel construction, 122 feet in length and has a beam of 27 feet. Her new power plant consists of two 400 hp. General Motors diesel tandem units of 12-cylinders each. They turn twin 54 in. screws with 59 in. pitch through 5:1 reduction. Her top speed is now approximately 13 mph. at 1550 rpm. The engines are operated from the pilot house with Morse Controls. The installation was made in Cleveland, Ohio by the Great Lakes Diesel Company, distributors for the Detroit Diesel Engine Division.

YOUR COPY OF DIESEL ENGINE CATALOG in its seventeenth completely re-edited, revised and expanded edition is now available. An invaluable aid to design engineers and buyers, it incorporates the latest diesel engine specifications and descriptions. Order your copy of this limited edition now. Profusely illustrated. \$10.00. Mail checks to DIESEL PROGRESS, 816 North La Cienega Blvd., Los Angeles 46, California.

DIESEL PROGRESS

605 Diesel Electrics on Canadian Railways

Although diesel electric locomotives have increased from five units to 605 in 10 years on Canada's two largest railroads, there has not been a corresponding decrease in the use of steam locomotives, two electrical engineers reported recently at the Winter General Meeting of the American Institute of Electrical Engineers in the Hotel Statler, New York City.

The Canadian National Railways and the Canadian Pacific, with 40,000 miles of rail from the Atlantic to the Pacific, have a total of 4,390 steam and diesel locomotives, compared to 3,982 in 1942. J. D. Sylvester of Canadian National, and D. F. Haney, of Canadian Pacific, told a symposium on land transportation. "The increase in the number of motive power units is indicative of the expanding economy and the increase in population in Canada," they observed. Canada was the first country in this hemisphere to use a diesel electric locomotive, placing a passenger unit in service on the Canadian National in 1928, but the program lagged for a number of reasons until 1942 when dieselization was accelerated.

One of the stumbling blocks to increased use of diesel electric units, the lack of Canadian fuel oil, was overcome with the opening of the Alberta oil fields in 1947. Units now total 728,750 horsepower, compared to 4,710 a decade ago. Diesel electric units on the two railways have accumulated 96,000,000 miles, over one-half in switching service, and the remainder in road service since 1948.

One of the problems encountered in operation of diesel units in Canada, they related, is climate. A train may leave Vancouver where the temperature is 50 degrees above zero, and in a few hours be in a snow storm or in temperatures of 40 degrees below zero. In general operating temperatures range from 100 degrees above zero to 50 below, leading to peculiar operating problems. One is the fine blown snow characteristic of low temperatures which passes through locomotive filters and builds up to a foot or more in the interior passageways of the unit and enters the main generator, traction motor blowers and electrical control compartments, resulting in frequent moisture grounds. It is necessary to winterize units in the fall by blocking filters 50 per cent and closing off generatory exhaust orifices, in order to use recirculated air rather than fresh air which carries snow. Another problem is starting in extreme cold. Locomotives, they said, are not stopped but left idling when not in the engine house.

New Headquarters

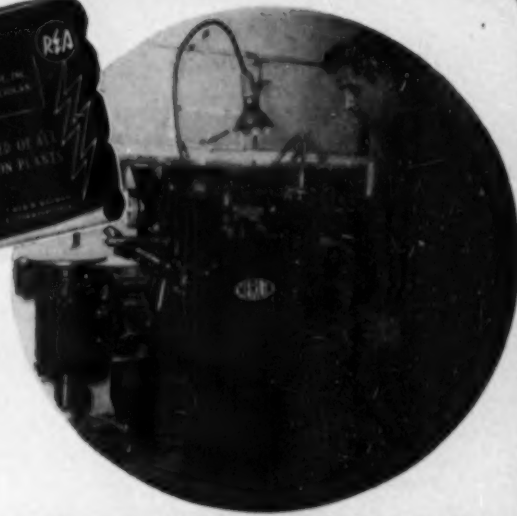
The Dallas branch of Stewart & Stevenson Services, Inc., has recently moved into new headquarters at 3919 Irving Blvd. Stewart & Stevenson is distributor for General Motors Diesel engines, Climax Blue Streak engines, Chrysler Marine engines, Chrysler Industrial engines, Petter Diesel engines, and Gardner-Denver pumps. The Dallas branch carries a complete stock of repair parts. Carsey Manning is manager.

APRIL 1953

69

WE ARE PROUD

to announce that Wolverine Electric Cooperative has installed the MERLIN Service Master to insure perfect functioning of their diesel injectors in their winning plant. You too can obtain the maximum efficiency from your injectors by following the same procedure and relying on the judgment of the Wolverine Electric Cooperative and all other diesel experts throughout the U.S.A. and the rest of the world.



IN 5 MINUTES

You Can Have Perfectly Reconditioned Atomizer Nozzles With A MERLIN Service Master In Your Own Shop

The Merlin Service Master is the first and only machine that will grind a point dead concentric with another portion and still maintain a predetermined angle within a minute of a degree. Few engineering institutions can even measure this degree of accuracy but the Merlin Service Master is guaranteed to produce it throughout its life. Every moving part is adjustable against wear.

Look At These Facts:

1. It is the only machine that will grind diesel atomizer nozzle needle seatings to manufacturer's original standards.
2. 90 laps or needles per hour can be ground to correct angles.
3. On the same machine — at the same time, a second operator can be lapping in seatings with laps or needles.
4. Without any loss of accuracy, the Merlin Service Master is adjustable for all grinding operations within its capacity.
5. It will grind valve seats, hardened tappets, taper or parallel rollers and pins.
6. It will instantly lap optic flats.

Install a Merlin Service Master at once.
It will keep your diesel engines at work.
It will cut your fuel consumption.
It will lengthen the life of your engines.

IN FOUR DAYS A BRITISH FIRM PAID FOR THE MERLIN SERVICE MASTER IN AMOUNT SAVED ON NOZZLES SERVICED. NAME & DETAILS SUPPLIED ON REQUEST.

World patents pending
Sole Manufacturers and Patentees:

The MERLIN

Service Master
THE MERLIN ENGINEERING CO., LTD.
HEBBLE MILLS, SALTERHEBBLE, HALIFAX, ENGLAND

Titeflex Promotions

The Board of Directors of Titeflex, Inc., Newark, New Jersey, has announced the following promotions: Henry S. Elder to executive vice president. He has served as vice president of Titeflex since joining the company in 1946. George K. Licht to vice president in charge of production at the Company's two plants in Newark, New Jersey. He joined Titeflex in 1935 and was appointed works manager in 1948. John J. Phillips to vice president in charge of sales and engineering. He joined Titeflex in 1940 and became chief engineer in 1949. In his new position, he will consolidate and coordinate the company's sales activities with its engineering operations. Mr. Phillips is a member of the

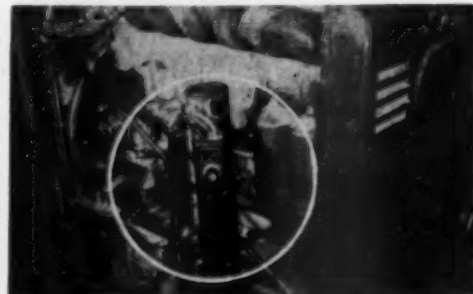
Society of Automotive Engineers. Titeflex, Inc., manufactures ignition harnesses and components and flexible metal hose predominantly for the aircraft and defense industries. Other products manufactured are flexible and rigid wave-guides, expansion-type bellows, electrical connectors, industrial fuses and filters.

Mack Motor Appointment

Appointment of K. L. Fitts as manager of off-highway truck sales for Mack Motor Truck Corporation has been announced by H. W. Dodge, executive vice president. Mr. Fitts joined Mack in 1945 as a national accounts salesman, and in 1951 was made assistant manager of that division. In his

new position he succeeds P. J. Fleming who recently retired after a long career with Mack. Mr. Fitts will continue to make his headquarters in Mack's home offices, Empire State Building, New York City.

Engine Heater



Diesel engines used in cranes, switch engines, trucks and other equipment used outdoors can be kept ready to operate in the coldest weather safely and automatically with electric heat. A few kilowatt-hours of electricity can save many man and equipment hours ordinarily lost in waiting for engines to warm up. Three cranes and a switching engine at Buffalo Slag Company, Lackawanna, New York, are heated economically and efficiently with Chromalox electric circulation heaters. These heaters are attached to the engine block with angle iron. With flexible connections to the cooling system, regular types of antifreeze are circulated by natural convection through the heater and engine block, warming the engine in a short time. Special pumps are not required. The photo shows one of the heaters attached to a crane engine.

The Chromalox electric circulation heater is a completely "packaged" unit with built-in elements, heating chamber, thermostat, and threaded inlet and outlet. On average winter mornings a 150°F. setting is sufficient to heat most engines in a half hour. In colder weather the heaters may be run all night at 90°F. For more detailed information about Chromalox heaters, write DIESEL PROGRESS, File 105, Box 8458, Cole Station, Los Angeles 46, California.

Improved Magnetic Plugs

The Magnetic Drain Plug Company of Wellington, Ohio is now making available magnetic pipe, drain and filler plugs ranging in size from 1/8 in. to 2 in. inclusive. They are made to original equipment standards in various styles and materials. These plugs are threaded "dryseal," eliminating leakers. Made of high energy, sintered, permanent "Alnico" magnets, they are sufficiently powerful to attract more than ten times their own weight. By attracting abrasive, ferrous particles directly from the oil or lubricant stream, these U. S. Magnetic plugs add to the life of engines and help prevent costly repair bills.

Appointed Distributor

The Duval Engine & Equipment Company, 1810 Brookpark Road, Cleveland 29, Ohio, has become a distributor for Ralph Stark, Inc. of Long Island City, New York. Duval will cover northern Ohio. Ralph Stark, Inc. specializes in the rebuilding of engine parts.

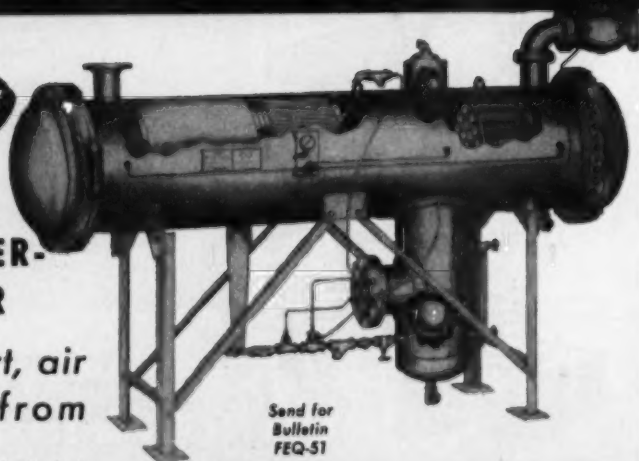
There is a vast difference between the easy job of removing warm water, dirt, and pipe scale from warm diesel fuel (Vis. 35SSU @ 122°F) compared to the almost impossible job of removing cold water, or ice crystals, from cold, viscous diesel fuel @ 10 F.

The 4-Stage EXCEL-SO Separator/Filter is designed to operate under these conditions, more efficiently, at less operating expense, than conventional single stage, or two-stage Filters only.

EXCEL-SO

4-stage
SEPARATOR-FILTER-
AIR ELIMINATOR

removes water, dirt, air
and pipe scale from
diesel fuel

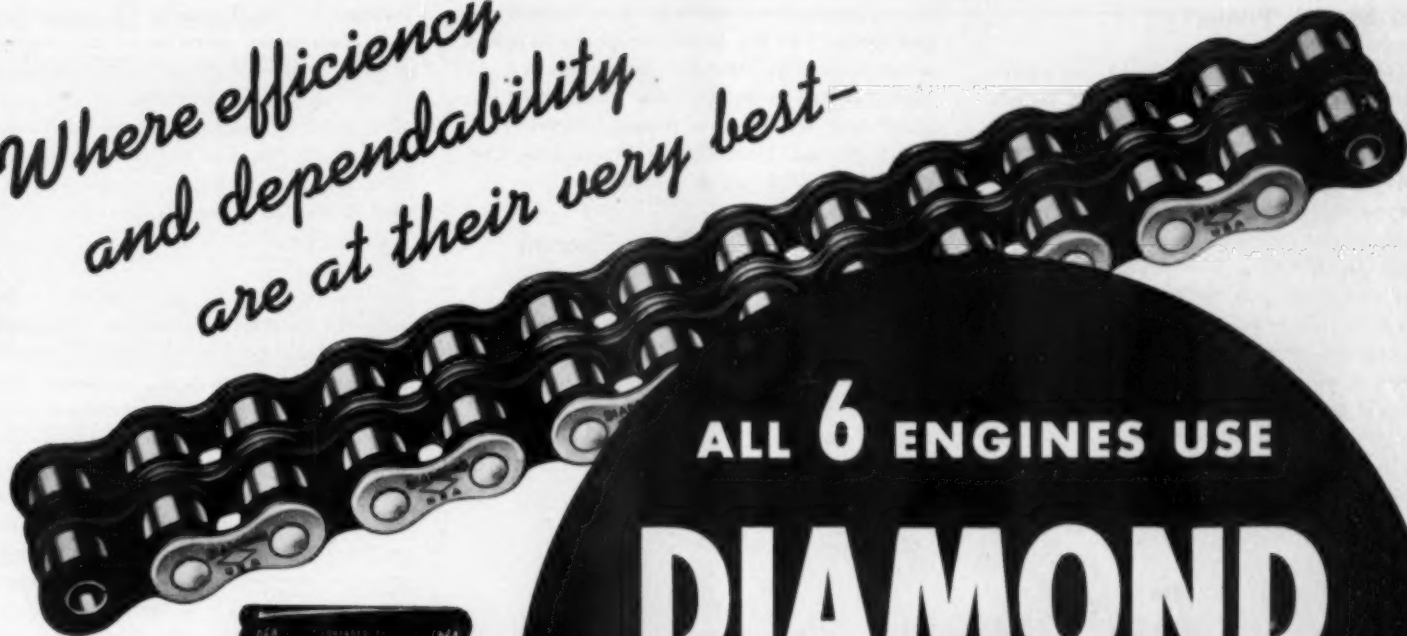


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FEQ-51

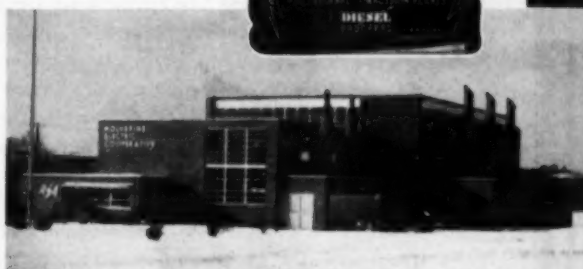
WARNER LEWIS COMPANY

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*Where efficiency
and dependability
are at their very best—*

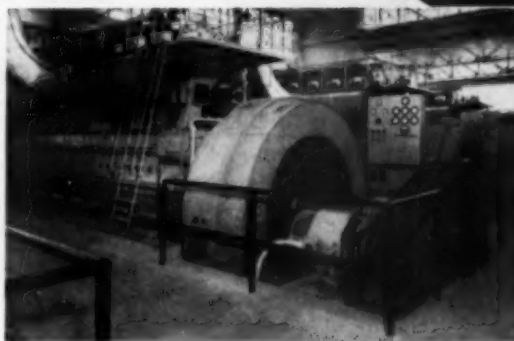


ALL 6 ENGINES USE
**DIAMOND
ROLLER CHAINS**
FOR TIMING OR
ACCESSORY DRIVES!



The Johnson plant of the Wolverine Electric Cooperative at Hershey, Michigan, winner of the Diesel Progress award for the most efficiently operated of all REA internal combustion plants.

The three big Fairbanks-Morse Model 31AD18 2 cycle Dual Fuel engines are rated 3500 hp. each at 277 rpm. Diamond Roller Chain, from crankshaft up and bending to one side over a pair of idlers, operates the camshaft which actuates the gas valves. The camshaft is 71" above and 45 3/4" to the right of the crankshaft. Diamond Roller Chain #433 (3/4" pitch double strand 276 pitches long) is used. Crankshaft and camshaft sprockets have 37 teeth each; idlers, 22 teeth.



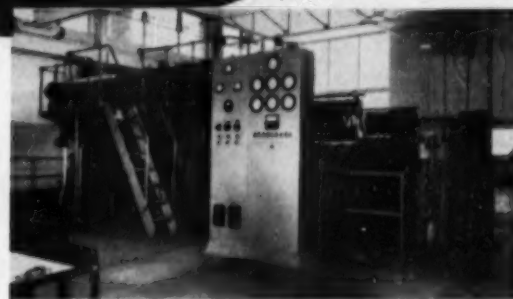
Diamond Roller Chains have been used by leading engine manufacturers for over a quarter century on all types of engines: gas, gasoline, diesel and dual fuel up to 5000 hp. and at speeds up to 10,000 rpm. They have proved their superior efficiency, dependability and economy for timing drives, fuel pump drives and lube and water pump drives as well as for power take-off.

Diamond Roller Chains simplify drive mechanisms and maintain

practically full efficiency for the long life of the drive. They are easily installed, light in weight and extremely versatile in application.

The Diamond Chain engineering staff is ready to give you immediate assistance and practical recommendations.

DIAMOND CHAIN COMPANY, Inc.
Where High Quality is Tradition
Dept. 407, 402 Kentucky Avenue
Indianapolis 7, Indiana

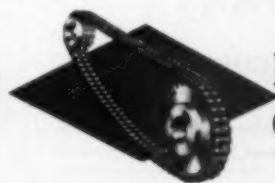


Diamond Roller Chains drive the fuel pumps on these three Cooper-Bessemer Dual Fuel engines. Model LS-8GPT 4 cycle, 1650 hp. engine uses 116 pitches of Diamond #472 single strand chain from a 48 tooth camshaft sprocket to a 24 tooth pump sprocket. The two Model JS-B-T 4 cycle engines use 118 pitches of Diamond #434 quad roller chain from the 40 tooth crankshaft sprockets to 32 tooth jackshaft sprockets.

**THESE DIAMOND FEATURES
IMPROVE ENGINE EFFICIENCY**

- Uniform highest quality
- Positive non-slip operation
- 98-99% efficiency
- Wide range of speed applications
- High power transmission capacity
- Adjustable to long or short shaft centers
- Long life dependability

DIAMOND



**ROLLER
CHAINS**

Diesel Engine "Primer"

A unique and informative new booklet on diesels, written in simple, non-technical language, has just been published by the P&H Diesel Division, Harnischfeger Corporation. Entitled, "What You Should Know About Diesel Engines," it effectively calls upon the grade school "primer" technique for both telling and illustrating the diesel story. Its main objective is to show just how simple the modern diesel engine is and how easy it is to understand its operation. The booklet records the diesel engine's invention and early development; compares it with the gasoline engine; tells about the 2-cycle and 4-cycle types of diesels; explains its operation in simple pictures and words; and

reports latest advancements in modern diesel engine design. The new 2-color booklet is in handy pocket size and has dozens of illustrations in its 28 pages. "What You Should Know About Diesel Engines" will be mailed on request. Address P&H Diesel Division, Harnischfeger Corporation, Crystal Lake, Illinois. Ask for it by name.

Preventative Maintenance Program Explained

A simple and easily followed maintenance program, developed for Euclid earthmoving equipment, is described in a twenty page booklet published by the Service Department of the Euclid Road Machinery Co. Title is, "Euclid's Guide to

Preventative Maintenance." The publication not only explains the operation of the program, but provides owners with a detailed outline of all points that should be checked at 100; 500; 1000; 2000; and 4000 hours of operation. All forms necessary for installing and operating the program are illustrated along with the maintenance check sheets used. These are patterned after those used in aircraft maintenance.

Paper work can be taken care of in a few minutes a day and the program is easily installed or adapted to operations where a preventative maintenance program has already been established. Heart of the program is a control system which notifies the shop when regular servicing intervals are due, checks on whether or not the work has been done, and provides an easily kept record of repair costs, fuel and oil consumption, and equipment availability. The program is the first comprehensive preventative maintenance program and control system to be provided by a major construction equipment manufacturer and includes all necessary forms. Copies of the booklet explaining its operation may be obtained by contacting your Euclid distributor or writing The Euclid Road Machinery Co., Cleveland 17, Ohio.

Eaton Diesel Engine Valves, Bolts, and Studs



Produced to meet the exacting requirements of Diesel Engine Service

A background of many years of experience as suppliers to the Diesel engine industry gives Eaton a thorough understanding of the peculiar problems encountered in this highly specialized field. Eaton has made far-reaching engineering contributions

applicable to practically all types and sizes of Diesel engines. Greatly enlarged manufacturing facilities permit the production of highly-stressed main-bearing and connecting rod bolts with forged heads, under strict metallurgical and quality control.

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

VALVE DIVISION: 9771 FRENCH ROAD • DETROIT 13, MICHIGAN

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings • Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamic Drives, Brakes, Dynamometers

Elected by Aeroquip



George J. Fischer



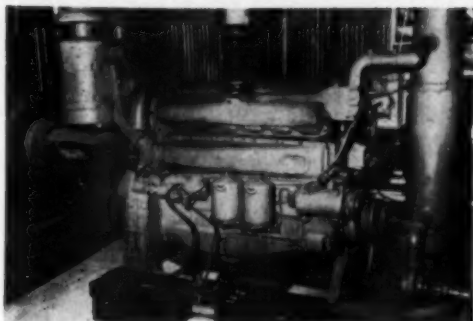
Matthew J. Betley

Election of George J. Fischer as vice president, Sales, and Matthew J. Betley as vice president, Manufacturing, of Aeroquip Corporation, Jackson, Michigan, was announced recently by Peter F. Hurst, president. Mr. Fischer was elevated from the position of general sales manager. Prior to joining Aeroquip, he was associated 18 years with the B. F. Goodrich Company of Akron, Ohio. A graduate of Heidelberg, Mr. Fischer completed his academic training with postgraduate work in the Harvard School of Business Administration. Mr. Betley assumes his new post after serving Aeroquip as works manager. He was previously associated with Electric Sprayit Corporation of Sheboygan, Wisconsin. A graduate of Ripon College, Mr. Betley also did graduate work at Northwestern University and Armour Institute. Aeroquip is one of the leading producers of flexible hose lines for aircraft and industrial application.

Three New Representatives

Three new representatives are announced by Farr Company of Los Angeles, manufacturers of Far-Air filters and air filtration equipment. They are the Johnson Filter Sales Company, Cleveland, Ohio, the Pittsburgh Air Filter Service Company, Pittsburgh, Penna., and Air Filter Sales & Service, Detroit, Mich., who will represent Farr sales and service in their respective areas.

Diesels Increase Production



Production has increased to as high as 84 bales of cotton per day at the Farmers Gin Company with the installation of this 6-cylinder GM diesel.

Substantial savings resulting from a year's use of diesel power in their cotton gin at Bethel, North Carolina, led the Farmer's Gin Company to specify the same type power when new ginning equipment was installed last September. A complete stranger to diesel power a little more than a year ago F. L. Blount Jr., co-owner of the gin, now operates three diesel units in the new gin and in his extensive farming interests in Eastern North Carolina.

Farmers Gin Company first switched to diesel at the beginning of the last ginning season. A 6-cylinder Series 71 General Motors diesel engine was installed and according to Mr. Blount operating costs dropped approximately 70¢ per bale. When the new equipment was installed, a 6-110 GM diesel took over the increased ginning load and the Series 71 GM diesel engine went to work on a sawmill on Mr. Blount's farm. The third piece of equipment is a new Allis-Chalmers tractor powered by another 6-cylinder GM diesel. The E. F. Craven Company, Detroit Diesel Engine Division Distributors at Greensboro, North Carolina was responsible for the installations.

Battery Bulletin

A four-page bulletin describing the engine starting characteristics of nickel cadmium batteries, has been issued by the Nickel Cadmium Battery Corp., 100 Park Avenue, New York City and is available upon request. It discusses principles behind the low-internal-resistance and negligible self-discharge qualities of Nicad batteries, and outlines the reasons for the long-life and trouble-free reliability of Nicad equipment. The publication also contains a comprehensive list of specifications to be used as a quick reference in determining Nicad battery needs for quick starting of all gasoline and diesel industrial engines.

Appoints Distributor

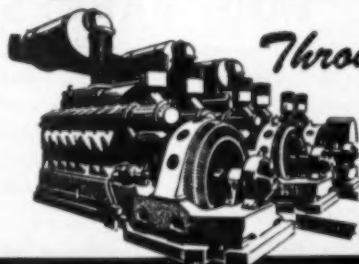
Pacific Airmotive Corporation has been named a distributor for all aviation products manufactured by Titeflex, Inc., under the terms of a recently executed agreement signed by Titeflex, Inc., and PAC. Seamed and seamless metal hose, ignition harnesses, and ignition shielding manufactured by Titeflex will be sold nationally and for export by PAC's five sales branches. Other distributorships handled by PAC include Pratt & Whitney Aircraft, Bendix Products, Bendix-Scintilla, Bendix Eclipse, B. G. Spark Plugs, B. F. Goodrich, Hamilton Standard Propellers, Exide Batteries.

APRIL 1953

**ASK THE
AEROFIN
MAN**
*About Practical
Heat Exchange*

There is a competent AeroFin heat-transfer engineer near you—qualified by intensive training and long experience to find the *right* answer to your own particular heat-exchange problem—and backed by the research and production facilities of the pioneers in light-weight extended surface.

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*AeroFin is sold only by manufacturers of nationally
advertised fan system apparatus. List on request.*

Diesel Electric Still 'Rail King'

The diesel-electric locomotive still is king of the rails and only one possible challenger for the crown is in sight, according to a prominent transportation engineer of the Westinghouse Electric Corporation. Charles Kerr, Jr., of Pittsburgh, Pa., told members of the American Institute of Electrical Engineers during their winter general meeting in New York City, that the diesel electric "has provided a locomotive with the best operating characteristics that the railroads have ever had for universal application to any and all types of service. This type of locomotive," he said, "has been a superior motive power unit to move rail traffic; it has produced large operating economies; it has

utilized efficiently a satisfactory type of fuel that has been available in ample quantities and at a reasonable cost; and it can be financed without jeopardizing railroad credit.

"The survival of the diesel as the dominant type of motive power on the American railroad seems threatened only by the gas turbine," Mr. Kerr added. "Locomotives so powered will be marked more by operation similar to that of the diesel than by any major dissimilarity. The railroads should have no fears should this type of locomotive make big inroads on the diesel. The gas turbine locomotive can only succeed if it proves to be a better and more economical prime mover for locomotive service. Nothing produces progress like competi-

tion," the speaker said. "Consequently two successful and proven competing types of locomotives can only result in better locomotives, which is the objective we are seeking."

Thanks to the diesel electric, the nation's railroads have been able to do a better job with fewer locomotives, Mr. Kerr pointed out. It was the ability of the diesel to deliver full power at all speeds that enabled the railroad operating departments to remove many restrictions in locomotive assignment, dispatching and use.

Completes Alaska Cruise



Within days after she was launched last year in Seattle, the 70 ft. dieselized yacht *Holiday* was off on a thirty-day cruise through Alaskan waters with her owner Lee H. Bennett of Seattle aboard. The craft covered a distance of 2260 miles at an average speed of nine knots for the 246 hours she was actually underway. Diesel fuel consumed for propulsion, heating and cooking during the trip totalled only 1671 gallons.

The *Holiday* was designed by Edwin Monk, Seattle naval architect and was built by Jensen Motor Boat Corporation, also of Seattle. An interesting feature of design is the extreme aft location of her diesel engine which permitted space for a very fine stateroom directly under the pilot house floor. The drive end of the engine faces forward with power diverted to the 40 x 36 propeller by means of a "V" gear designed and fabricated in Mr. Bennett's own marine machinery shop in Seattle. The craft is of wood construction, has a beam of 15 feet and a draft of 5 feet. Power is supplied by a General Motors 6-110 diesel engine with hydraulic clutch and reverse gears.

Appointed District Engineer

Appointment of J. F. Kidwell to the position of district engineer with headquarters in Denver, Colorado, was announced by D. H. Queeney, general service manager of Electro-Motive Division of General Motors, LaGrange, Ill. A native of Downers Grove he received his early education there and attended Iowa University. He joined Electro-Motive in 1941 as an apprentice draftsman. He progressed to manager of the Maintenance Section and served as a service engineer before his recent appointment. With Mrs. Kidwell he resides at 636 Washington Street, Apt. 1, Denver.

YOUR COPY OF DIESEL ENGINE CATALOG in its seventeenth completely re-edited, revised and expanded edition is now available. An invaluable aid to design engineers and buyers, it incorporates the latest diesel engine specifications and descriptions. Order your copy of this limited edition now. Profusely illustrated. \$10.00. Mail checks to DIESEL PROGRESS, 816 North La Cienega Blvd., Los Angeles 46, California.

The most efficiently operated of all REA internal combustion plants



Uses...

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It takes the operators of a prize-winning plant like WOLVERINE to recognize the value of utilizing the most efficient operating equipment: For complete accuracy and dependability—progressive and far-seeing industrialists throughout the country are installing LIQUIDOMETER tank gauges . . .

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- 100% automatic
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F-M Changes in Organization



William B. Morse

A number of changes have taken place in the Fairbanks-Morse organization recently, as follows: William B. Morse, formerly assistant to the manager of the Detroit, Michigan sales and service branch of the company, has been appointed manager, succeeding E. J. Hay, deceased. "Bill," as he is known to his many friends and business associates, is a great grandson of the founder of the company and son of Robert H. Morse, Jr., President. He has been with the company since 1946, starting in the Beloit Works. From 1948 to 1951 he was a salesman for the San Francisco branch, which position he filled successfully until his transfer to Detroit in the fall of 1951.

B. R. Eng, who has been with the company for many years in various capacities in the administration accounting division, was appointed assistant comptroller. J. E. McQuilkin, general auditor, moved to Montreal, Canada, where he is assistant to the president of The Canadian Fairbanks-Morse Company Limited. Frank M. Mason, Jr., formerly director of engineering, has been appointed coordinator of United States Government business. J. F. Weiffenbach, formerly vice president in charge of manufacturing of the Canadian Locomotive Company, Limited, Kingston, Canada, has been appointed to the position of chief product engineer, Manufacturing Division, Fairbanks, Morse & Co., with headquarters in Chicago.

W. E. Watson has been assigned works manager, Canadian Locomotive Company, Limited, Kingston, Canada. J. R. Walsh, who has since 1948 been manager of the Stuttgart, Arkansas works, has been promoted to manager of the company's new plant now nearing completion in Kansas City, Kansas, where a complete line of pumps and oil-field engines will be manufactured. W. P. McAnally, formerly supervisor of production at Stuttgart, succeeds Walsh as manager of the Stuttgart Works.

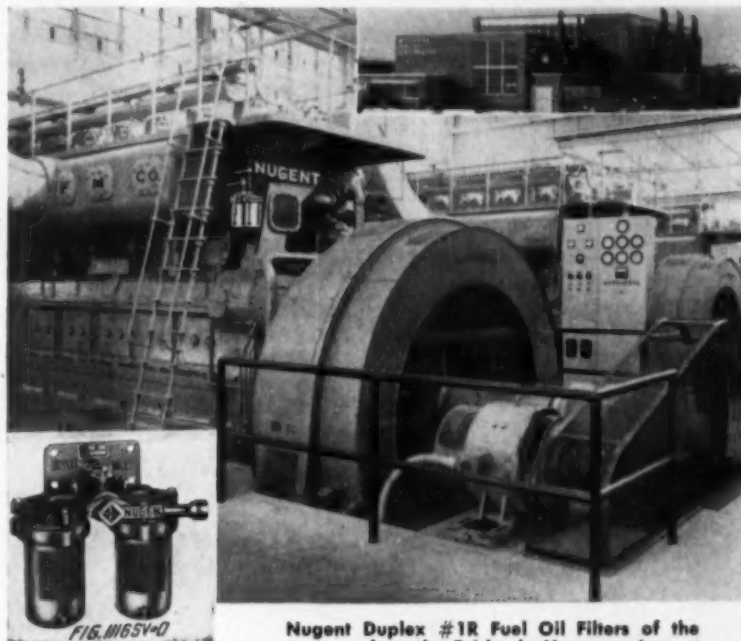
Steel Erection Crane



With its 100 foot boom, this Model 3900 Manitowoc Speedcrane, powered with a 275 hp. Model NHIS-600 Cummins diesel, lifts heavy steel sections with ease. Here, the Cummins powered Manitowoc, owned and operated by Al Johnson Construction Company, Minneapolis, prepares to swing a steel section into position at the site of the St. Anthony Dam project on the Mississippi River in the Minneapolis-St. Paul area.

APRIL 1953

R. E. A. Plaque Winner uses NUGENT Fuel Oil Filters



Nugent Duplex #1R Fuel Oil Filters of the type used on the Fairbanks-Morse engines at the Wolverine Electric Coop, at Hersey, Mich.

NUGENT DUPLEX OIL FILTERS are used by the Wolverine Electric Cooperative plant at Hersey, Mich., the 1952 winner of the Diesel Progress Plaque for the most efficiently operated R. E. A. plant. Our hat is off to the Wolverine management and staff who operate this plant in such an able manner.

Included in the plant are three Fairbanks-Morse dual-fuel engines, each equipped with a Nugent Duplex #1R Filter in the fuel oil line. These filters remove dirt and moisture as small as a few microns from the vital pilot fuel oil supply. They screen out foreign material that might clog injection units, cause excessive engine wear, or lead to faulty combustion.

Each unit of a Nugent Duplex #1R Filter can be operated independently or in parallel with the other unit. Thus the filter can be cleaned without interrupting operations. The filtering medium is a large area bag of closely woven, lintless, acid-resisting material. The bag is easily cleaned for re-use or is replaceable at low cost.

Nugent filters are available in a complete range of sizes to meet every filtering need. Outline your filtering requirements and write to us for full data.



Wm. W. Nugent & Co., Inc.
415 N. Hermitage Ave. CHICAGO 22, ILLINOIS

OIL FILTERS, CRANK AND PISTON RINGS, TELESCOPIC SHAFTS, OILING DEVICES, LIGHT TRED VALVES, FLOW INDICATORS
Representatives in: Boston • Cleveland • Detroit • Kansas City • Los Angeles • Minneapolis • New Orleans • New York • Philadelphia • Portland, Ore. • San Francisco • Seattle • St. Louis • Tulsa • Washington, D.C. • Wichita, Kan. • Youngstown, Ohio

Cooperate to Build Locomotives For Holland

Three American companies will provide technical assistance enabling three Dutch manufacturers to produce 100 diesel-electric locomotives valued at approximately \$15,000,000 for the Netherlands Railways, it was announced recently by the Westinghouse Electric International Company. The three-way segment will enable the Dutch railroad to obtain units which are American in design, except for such details as couplings and buffers. It is a "significant example of how private industry can further the aims of America's Point Four Program" according to F. Q. Den Hollander, president of the Netherlands Railways, who recently visited this

country in connection with modernization of his country's rail transportation system.

HEEMAF, of Hengelo, largest Dutch electrical manufacturing concern, which has produced electric traction apparatus under Westinghouse license since 1922, has been awarded a contract for the 80-ton road switching units. The company will receive manufacturing information and technical assistance on production of the electrical components from Westinghouse. Similar information on mechanical components will be provided by the Baldwin-Lima-Hamilton Corporation through HEEMAF to Allan, of Rotterdam, where the units will also be assembled. National Supply Company, the third American firm participating in the agree-

ment, will provide information on its diesel engines to Machinefabriek, of Hengelo, where the power plants for the 100 locomotives will be built.

"Purchase of these new locomotives constitutes one of the last steps in our post-war reconstruction of the Netherlands Railways," Mr. Den Hollander said. The order is part of his plan to convert from steam to electric and diesel-electric operation, a program which was begun in 1949 with the purchase of 25 electric locomotives built principally in Holland according to designs furnished by Westinghouse and Baldwin-Lima-Hamilton Corporation. "We are looking forward to these diesel electric locomotives to round out our system, because they will save us vast quantities of coal which we must otherwise buy from dollar areas," the Dutch official continued. The line uses mostly steam locomotives for freight.

Opens Spokane Branch



Lewis F. Parsons




Roy Cranshaw

T. J. Bannan, president of Western Gear Works, has announced two new appointments. With the opening of the Western Gear Works Spokane branch on March 2nd, Lewis F. Parsons will serve as manager of that office. This office brings the products, facilities and services of one of the largest gear making companies west of the Mississippi to eastern Washington. Heading the newly formed Mission-Western Engineers, Inc. of Pasadena, California is Roy Cranshaw as president. Mr. Cranshaw will also continue his duties as assistant to the president of Western Gear. The Mission-Western Engineers, Inc. was formed for the purpose of handling customer service functions of Western Gear Works Mission plant in Pasadena, manufacturers of rotary electrical and electronic equipment.

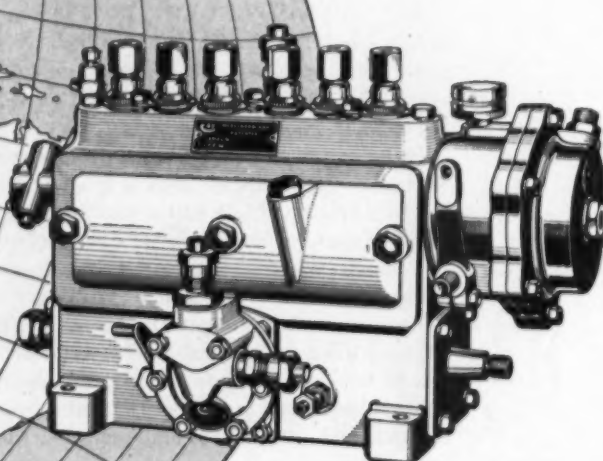
Book Shows Complete Euclid Line

A new 48 page book covers all the types of earth-moving equipment manufactured by the Euclid Road Machinery Co. It also contains information on the selection of the proper type of equipment for various types of work and explains the manner in which twin-power, the use of two engines powering separate axles, is employed in some models. The complete line of Euclid rear-dumps, bottom-dumps, scrapers and loaders are illustrated along with job views of them at work. Brief specifications and typical performance figures are given for the various models and individual design features explained. Contractors, mines, quarries and other users of heavy duty earthmoving equipment may obtain a copy by requesting one on their company letterhead. Title is, "Euclid Equipment for Moving Earth, Rock, Coal and Ore." Contact your Euclid distributor or write The Euclid Road Machinery Co., Cleveland 17, Ohio.




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for diesel engines



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100 countries*



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Sales Office: 14820 DETROIT AVENUE,
CLEVELAND 7, OHIO.**

Two More for Florida Waters



The shrimper *Miller Bros.* of St. Mary's, Ga., on her trial run up the San Sebastian River near St. Augustine, Florida.

Recently launched and already shrimping in the Gulf of Mexico are the two new shrimp trawlers *Miller Bros* and *Liebling*. They were designed by Tams Inc. and built by Diesel Engine Sales Co. of St. Augustine, Fla. The 67 x 18 crafts are of wood construction and are complete "package units" which is so popular with shrimp trawler owners.



The *Liebling* of Fort Myers passing the machine shops of Diesel Engine Sales Co. on the San Sebastian River in St. Augustine, Florida.

The *Liebling* is owned by Frank Haneburger of Fort Myers, powered with a D 13000 Caterpillar diesel, Twin Disc clutch, Snow Nabstedt reduction gears and turning a 48 x 44 four blade Columbian propeller. The *Miller Bros.* is owned by Miller Bros. of St. Mary's, Ga., and is powered with a 6-71 General Motors diesel, has a 46 x 36 four blade Columbian propeller. Both have Delco Remy starting generators, Southway batteries and Goulds pumps. Their speeds on the trial runs were 10 knots and they probably will make the West coast of Florida their home port.

Trailer-Mounted Drilling Rig



This trailer-mounted drilling rig, owned by Sharmex, S. A., Mexico, drilled five 3,000 foot wells in seven months since it was put in operation in May, 1952, although shut down for two months during the rainy season. Two of the wells are now producing about 900 barrels per day each. The rig is a National Supply Ideal Type T-32, powered by a diesel engine. The trailer assembly includes a 95 foot mast. The rig also includes an independently powered Ideal Type C-150-B Slush Pump. Auxiliary equipment includes an Ideal FE-17½ Rotary, a Type 324-E-90 Hook Block, and a Type L Swivel, all manufactured by The National Supply Co. The rig is shown at work on its second location, Horcon 106, about 30 kilometers north of Poza Rica.



Torque multiplication up-to-6 times—combined with smooth, powerful, automatic torque converter braking—are making these Dart Model 140 Trucks stand out in hauling performance and operating economy at the Pickands-Mather Company's West Hill Mine at Coleraine, Minnesota.

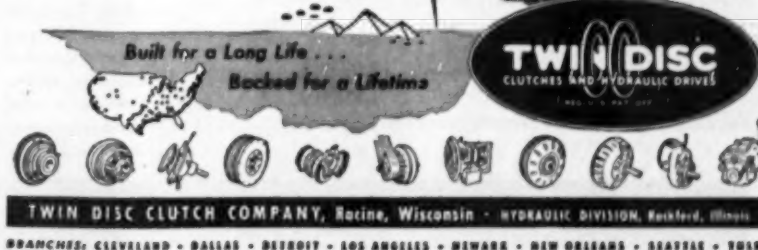
The power of their 300 hp Cummins NHRS Diesel engines is delivered through Twin Disc Model CF Torque Converters—providing smooth uninterrupted acceleration on steep pulls—as power transmitted stays in balance with load demands. Operators control their trucks both on the steep up-grade and downhill runs with the accelerator—seldom have to shift gears, or touch the brake pedal.

In heavy-duty off-highway trucking applications, Twin Disc Model CF Torque Converters are contributing to bigger payloads handled

faster... and sharply reduced equipment maintenance costs.

Get the full story on Twin Disc Torque Converters for all on-and-off-highway trucking applications. Write for Bulletin 501.

Twin Disc offers two truck type torque converters—Model CF (top) with automatic torque multiplication and downhill braking for foot-pedal control on short, steep, up-and-down hauls—and Model DF (below) with selective operation on all functions—downhill braking, uphill pulling, and Direct Drive for the straightaways.



BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TORONTO

Torque Converter Story

The inside story of the General Motors torque converter, now an integral part of a number of GM diesel engine models, has just been published by the Detroit Diesel Engine Division. The book is well illustrated with cutaway drawings, curves showing the horsepower characteristics of engines so equipped and photos of torque converter units at work in typical installations in the industrial, construction, logging and petroleum fields. Fully explained are the operating principles of the unit which provides smoother power flow and protects engine, transmission and driven equipment from damage which often occurs as a result of sudden load changes. The folder is available from Detroit

Diesel Engine Division distributors and dealers or by addressing the Division at 13400 W. Outer Drive, Detroit 28, Michigan.

Dieselized Mobile Plane Hangars

A mobile, self-propelled airplane hangar is the latest innovation at the Marine Air Station at Cherry Point, N. M. In order to facilitate the speed with which a plane takes off, the new hangar, which comes apart to leave planes in the open, has diesel electric units in each half. The hangar is diamond shaped and the halves come apart within sixty seconds. Each half weighs 55 tons and is mounted on wheels running on tracks. The hangar is prefabricated and made with standard structural steel

forms. At its diamond pointed ends are the workshops needed to service the aircraft. A newer model to be built will have rubber tires and each half will be able to roam at will. As in the first unit, diesels will supply the power.

Industrial Lubricants Appointments



W. C. Kennedy



Hubert E. Evans

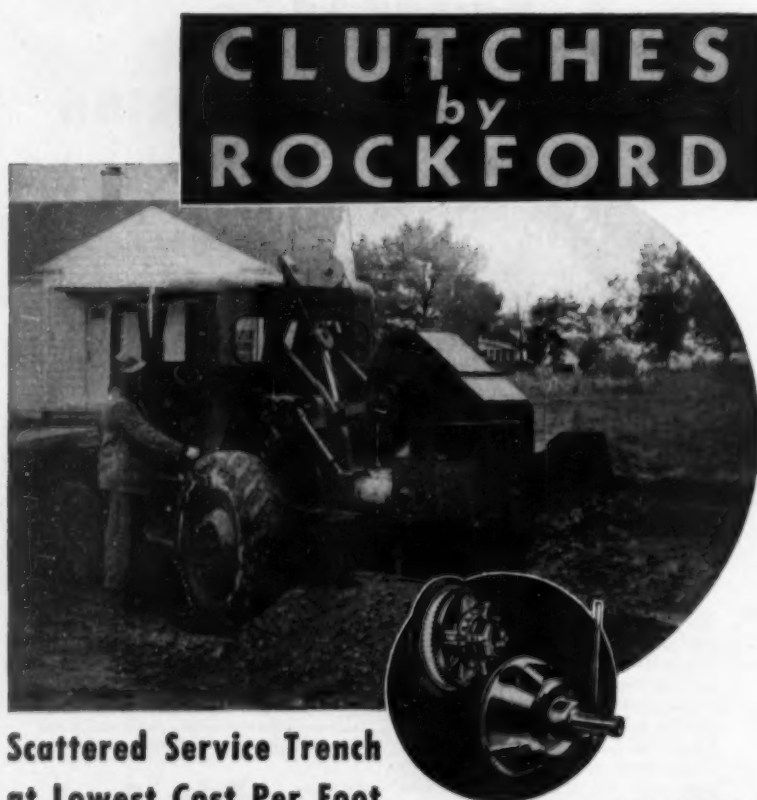
Industrial Lubricants Company, Inc. announces the appointment of W. C. Kennedy as general sales manager and Hubert E. Evans as chief chemist. Mr. Kennedy comes to Industrial Lubricants with 20 years' executive experience in the automotive, materials handling, aircraft and industrial chemical lubrication industries. This experience has been gained at the regional, national, and international levels of manufacturing, sales and service. Mr. Evans, previously a technical director for a manufacturer in a related field, will be in charge of new product development and control. He has over 25 years' experience in research and development, engineering and sales and customer service. He was recently elected chairman of the Board of Science Service Systems, Inc., registered engineers and consultants. Industrial Lubricants is one of the nation's oldest manufacturers of polishing cement, drawing compounds, cleaners, and rust preventives.

Formsprag Folders

Formsprag Company has announced the issuance of new folders illustrating a line of over-running, indexing and backstopping clutches made with a full complement of "sprags." It is claimed that this type of clutch gives greatest torque capacity for size and weight. Application and engineering data are included. For copies of the folders, write Formsprag Company, 23601 Hoover Road, Van Dyke, Michigan.

Announces New Bulletin

A new 12 page illustrated booklet which explains the characteristics and advantages of air power and describes the three fundamental types of air control valves has been released by the Ross Operating Valve Company, Detroit, Michigan. The three basic models are the integral pilot operated, known as Ross Introl; the remote controlled, known as Ross Retrol; and the direct operated. With minor variations, these units can be adapted to a range of applications. Colored diagrammatic drawings show clearly how the air flows through the valves and to the operated cylinders. The advantages of each type, an explanation of how they work, and a list of available standard models are included. The new booklet which furnishes information never before obtainable in printed form is known as Ross Bulletin No. 101A and will be sent free upon request.



Scattered Service Trench at Lowest Cost Per Foot

The Barber-Greene RUNABOUT Ditcher travels from job to job and begins digging with minimum waste of time, under all road and digging conditions. ROCKFORD Power Take-Off CLUTCHES help it spot, dig, scrape and backfill dependably and economically. Let ROCKFORD engineers help develop power transmission control for your product.

Send for This Handy Bulletin

Shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.



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CLOVER LEAF

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BRITISH COLUMBIA PACKERS, LTD.
VANCOUVER, B. C.

This converted YMS workhorse is powered with a super-charged Model P6 UNION Diesel engine, 6 cylinders, 12" bore x 15" stroke which continuously develops 730 horsepower at 500 revolutions per minute.

The UNION DIESEL ENGINE Co.
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GOVERNORS by PICKERING

For 90 years the name Pickering has been associated with fine governors. The full line covers all requirements of diesel, dual fuel, steam and gas engine as well as turbine speed regulation.

**ALL MODELS AVAILABLE IN EITHER
CONSTANT SPEED OR VARIABLE
SPEED TYPES.**

To secure complete research and design engineering co-operation on governor problems, write

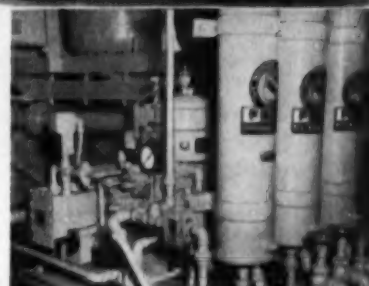
THE PICKERING GOVERNOR CO.
ESTABLISHED 1842
affiliated with **BUEHLER INC.**
PARAMUS - NEW JERSEY
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FRAM FILTERS help protect new engines

Owl's Head, City of New York sludge boat, uses Fram Filters combined with De Laval Puri-Filter to purify lubricating oil for Fairbanks-Morse diesel engines.



Lubricating oil is cleaned by Fram Filcron Filters and De Laval Centrifuge... circulated under pressure through diesels by engine-driven pumps.

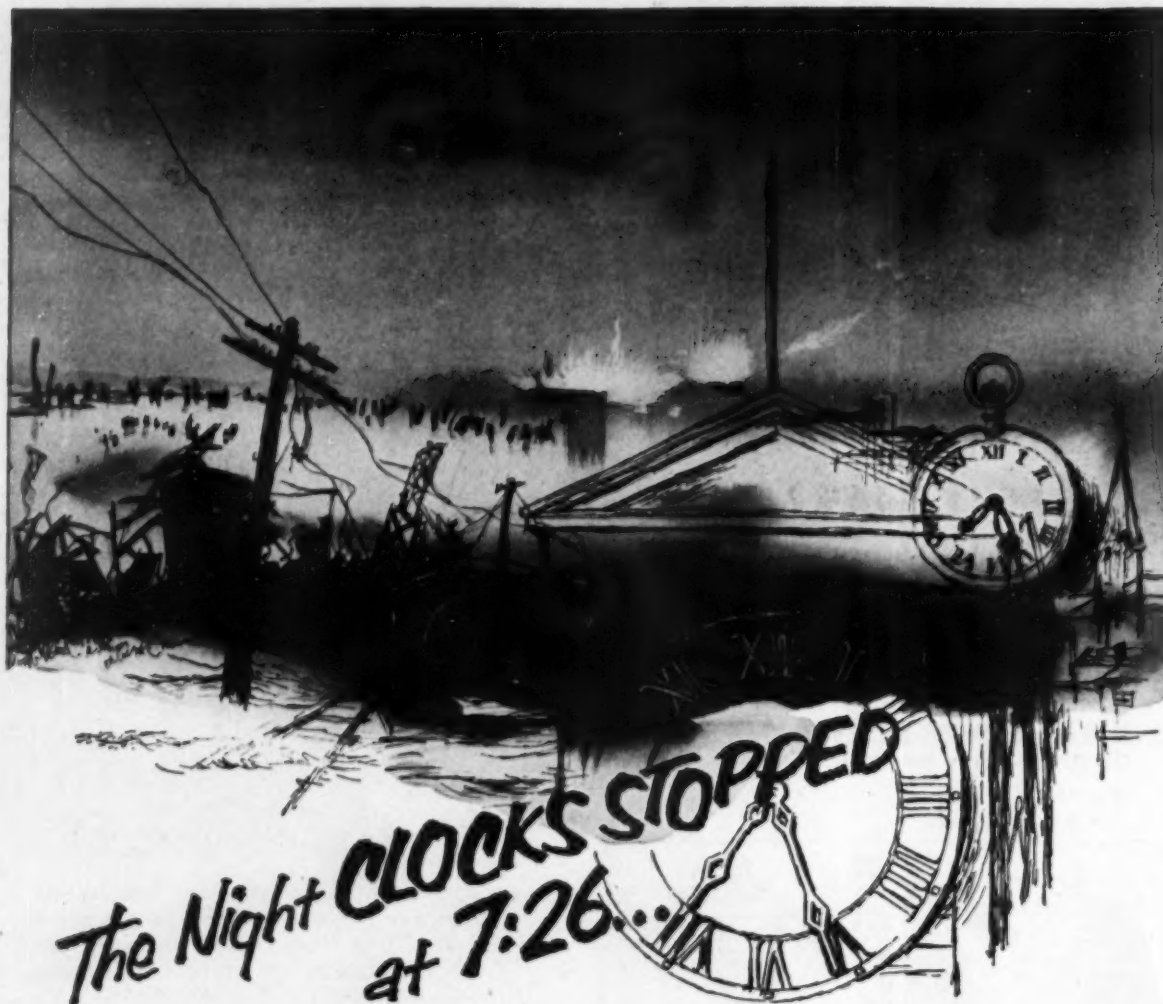


AS part of an expanding sewage disposal program, the City of New York has put a new sludge boat, *Owl's Head*, into full service. In constant use regardless of weather, her diesel engines must be protected to insure dependable operation at all times. To help guard those engines, Fram Filcron Filters, used as part of the De Laval Puri-Filter, were installed.

Solve Your Filtering Problems with FRAM!

Whatever your filtering problem—lube or fuel—Fram Filters are the solution. Let Fram's Engineering Department PROVE that Fram Filters remove all engine-killing contaminants one micron (.000039") and larger... keeping oil clean even after maximum use. You'll find that Fram Filters pay for themselves by lowering your operating costs—reducing wear on liners, rings, and bearings, increasing time between overhauls, cutting rate of oil consumption. Make your diesels produce at top efficiency for the lowest possible cost... write TODAY to the FRAM CORPORATION, Providence 16, R. I. In Canada: J. C. Adams Co., Ltd., Toronto, Ontario.

FRAM Filcron
THE MODERN OIL FILTER



Some 9,500 people were in South Amboy, N.J., that drizzly evening in 1950. At the waterfront, longshoremen were transferring the last of 12 freight cars of ammunition to lighters that would carry it to a waiting vessel in Raritan Bay.

But the City Hall clock never got to 7:27—and the freighter's deadly cargo never got loaded. Explosions shattered windows over a

radius of 12 miles; and hundreds of people looked at their arms and legs and saw that flying daggers of glass had stabbed them.

At dawn, 312 of the injured had been counted.

Such disasters have happened many times before in America. They could happen again. And if they do—and when they do—there must be blood plasma on hand to take care

of the injured. For blood saves lives!

But blood cannot be mined or manufactured. It must come from the veins of healthy men and women. Men and women who feel concern for a suffering neighbor. So give blood—now!

Whether your blood goes for Civil Defense needs, to a combat area, or to a local hospital—this priceless, painless gift will some day save an American life!



**Give
Blood
Now**

**CALL YOUR
RED CROSS TODAY!**
National Blood Program

Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

☐ Have you given your employees time off to make blood donations?

☐ Do you have a Blood Donor Honor Roll in your company?

☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

☐ Have you arranged to have a Bloodmobile make regular visits?

☐ Has your management endorsed the local Blood Donor Program?

☐ Have you informed employees of your company's plan of co-operation?

☐ Was this information given through Plant Bulletin or House Magazine?

☐ Has your company given any recognition to donors?

☐ Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a single pint of blood may mean the difference between life and death for any American . . . the need for blood is *urgent!*

PRESENTING THE DIESEL PROGRESS AWARD

BIG Rapids, Michigan, March 12th. Rex W. Wadman, Editor and Publisher, today at the Board of Directors Meeting of the Wolverine Electric Cooperative awarded the DIESEL PROGRESS award for the most efficiently operated of all REA internal combustion plants in the following words:

A couple of years ago a very bright idea was generated in Washington and that idea was that a contest should be set up among the internal combustion engine plants of the Rural Electrification Administration. Out of this plan and out of this thought was outlined the Annual Award to be given to the most efficiently operated of all REA internal combustion engine plants. It was suggested at that time that DIESEL PROGRESS, reaching as it does all such plants, should be invited to become the sponsor of this Annual Award. I not only felt at that time that it was a good idea—I was in fact honored.

I realized that within this group of REA financed plants there is a community of interest and a singleness of purpose that makes possible the creation of a healthy competitive spirit. And, therefore, we had the basis of programs that could not possibly be implemented amongst the thousands of plants that do not enjoy this common bond. It is indeed a master stroke of progress to put a finely organized group of machinery together in a generating plant and bring its benefits to thousands of people. And also, it is quite another stroke of genius to get the utmost out of that plant through constant vigilance over the thousand and one details of operation and maintenance. So I thought the mere sponsorship of a plan to bring about greater efficiency-consciousness within this fine group of plants was something well worth my time and attention and we, the staff of DIESEL PROGRESS, have been very happy to work with the REA and with the individual REA plants. I am happy to be here today in Big Rapids to award the DIESEL PROGRESS plaque to Admiral Denis Ryan, Manager of the Wolverine Electric Cooperative whose plant at Hersey, Michigan, known as the Johnson plant, proved to be the most efficiently operated of all REA internal combustion engine plants during the year 1952.

We realize, at the outset, the almost innumerable factors that determine the final cost of putting current on the line, which, in the last analysis, is the measure of efficiency. In conference with your REA officials in Washington, we weighed these factors—



Left to right: Germaine Lockwood, chief operator, Hersey Plant; J. B. McCurley, chief, power division, REA; Carl C. Johnson, president board of directors of the cooperative; Denis L. Ryan, manager of the cooperative; Rex W. Wadman; John C. Keen, assistant manager of the cooperative.

many of them practically imponderable. We wanted, above all else, to arrive at a formula that would be equitable to all, and at the same time, reduce the large number of disparities to a common denominator. All REA plants strive for good plant operation—this we know—and no one should be penalized for natural advantages other plants may have—this we considered. So it became evident that the winner of this award would be the plant showing the lowest cost per kilowatt hour, taking into account wide differences in the cost of fuels in the various parts of the country as well as all types of fuel used. This I will try to explain.

Taking the data from your own reports for the year 1952 as submitted to the REA in Washington—your total btu. consumption was costed on a uniform basis of 50¢ per million btu.'s. This produced an adjusted fuel cost figure. Then the difference between the adjusted fuel cost and your actual fuel cost became the adjustment figure which was a plus factor where actual fuel costs were abnormally low, and a minus factor where fuel costs were higher than normal. This adjustment figure was then added or subtracted—as the case might be—to or from your total production cost as shown on line 10 of your monthly reports. Then your cost per net kwh. was calculated on the basis of the adjusted production cost. This procedure brought about surprisingly uniform results amongst the plants that were screened by REA for final analysis in this contest. It is interesting to note that your plant—under this formula—because of the low fuel cost in your area, suffered a plus adjustment of \$24,954.00—equal to a little more than 20% of your actual fuel cost. And you still came out with the lowest cost per kwh. amongst all of the REA plants reporting in 1952. The first 5 plants were very close

together. On the basis of the equated fuel cost, your figure comes out as 6.85 net mills per kwh., although your actual net cost per kwh. last year was 5.96 mills.

And now let me add that someone had to win this award. Had there been a tie, there would have been two plaques awarded, I can assure you of that. In our April issue, which is now being printed out in Los Angeles, we will show a table which gives full details of the top five plants, the net result of which I gave you a few minutes ago. I wish I could portray in the magazine the very fine interior effect of your plant at Johnson, the fine selection of colors for your walls, your floors, etc. but that is difficult to do in a magazine which is printed in black and white. But I do want to tell you gentlemen that you have a fine plant up there at Hersey and that your crew engages in very fine housekeeping. It's a clean, business-like installation, well laid out in the first place, well operated in the second place, and obviously, your management and your crew take pride in the physical appearance of the shop, which is a great big item in adding to overall efficiency.

Thank you gentlemen for the privilege of being here at Big Rapids today and may I wish you the best of luck for 1953. But don't rest on your laurels. As you notice from the figures that appear in our April issue, there were four plants close on your tail this year and the competition is getting keener and keener as this contest of ours arouses more interest within your big group.

It now gives me a great deal of pleasure to hand the DIESEL PROGRESS plaque to Admiral Denis Ryan, your highly efficient manager.

Bay Area Diesel News

By BRUCE WADMAN

SAN FRANCISCO, March 15: The contract for a 1000 kw. completely automatic stand-by diesel generator set for the San Francisco Airport has been awarded to Enterprise Engine and Machinery Co. The GE generator will be driven by an Enterprise Model DSG 318 diesel, with Synchrostart automatic controls and a GE switchboard. This unit will supplement existing small stand-by units and will assure continuous power supply for building and field lighting and control tower facilities regardless of the emergency.

FOR Pacific Telephone and Telegraph Company, West Coast Engine and Equipment Co. has supplied a 20 kw. trailer mounted diesel generating set. A 50 hp. model 2055 GM diesel supplies the power for the set, which will be used in Nevada for emergency power along the transcontinental TV power transmission line.

TWO Gantry shipyard cranes have been changed over from captive electric power drive to diesel generator set drive. The cranes used to be supplied by an electric cable as a power source, but they have been moved to a new location and have been fitted with diesel generator sets housed on the cranes themselves. A 200 kw. generator, driven by a supercharged Buda diesel developing 350 hp. at 900 rpm., supplies the power for each crane. The cranes are located at Mare Island Shipyard and are

now completely self-powered with the installation of these power units supplied by King-Knight Co.

REPOWERING a Model 37 Marion electric 2 yard loader shovel, a Cummins Model HR-600 rated at 150 hp. has been installed to replace a 75 hp. electric motor. The diesel operates a 50 kw. GE generator on the shovel, which is owned by Caldor Lumber Co. of Diamond Springs, Calif.

A NORTHWEST Model 25 shovel, owned by O. C. Jones of Berkeley, has been repowered by a Model 3055 GM 85 hp. diesel. A LeTourneau dozer, owned by Western Pacific, has been repowered by a Model 6055 GM 160 hp. diesel.

IN THE Yarrow Shipyard in Victoria, B. C., the Blackball Lines is revamping an old ferry from the bottom up. The power will be diesel electric, and the engines, four GM Model 16-278-A diesels rated at 1600 hp. each, are now being installed in the ferry, which will be twin screw, two engines on each screw.

A COMBINATION trawler and sport-fishing boat, the *Norma Joan*, is making her debut in sport-fishing in the Bay Area this spring. This vessel, which measures 35 ft. overall, is owned by Parker Diesel Engineering Co. of Oakland. Power is supplied by a P&H Model 387-CM diesel rated at 68 hp.

TWO NEW tugs for the Red Stack Towboat Co. of San Francisco are either completed or in the

final stages of construction at Pacific Drydock in Oakland, where they are being outfitted. The identical tugs are 97 ft. 9 in. long, with a depth of 14 ft. 2 in. and a beam of 24 ft. 8 in. Each tug is powered by a GM Model 12-567-A diesel rated at 1000 hp. The *Sea Duke* is being commissioned some time in March, and the *Sea Queen* will be commissioned in April. These vessels will be used for general docking purposes in the Bay.

THE FIRST of two new 120 ft. towboats was launched on February 16 at the Albina Engine and Machine Works in Portland. Each vessel is powered by two Enterprise Model DMG-6 diesel engines, each rated at 600 hp. at 600 rpm. The new Enterprise hydraulic single lever control is being employed for maneuvering these twin screw towboats, which will be used for special service on the Yukon River.

THE 1953 Boat Show was held in San Francisco from March 6 to March 15. Of particular interest was the introduction of the brand new lightweight Graymarine diesel. This six cylinder marine diesel is rated at 100 hp. continuous. Hall-Young Co. of San Francisco is the local distributor for this new engine.

THE National Supply Company's engine division branch, located at 2510 Grove Street in Oakland, has recently become the distributor for Lister stationary diesels in Northern California, Nevada and Utah.

YOUNG

Cooling Pays Off Again!



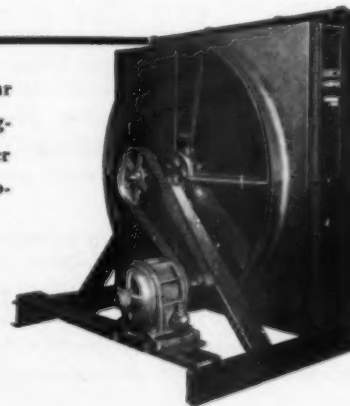
REA TOP EFFICIENCY AWARD PRESENTED TO ANOTHER YOUNG CUSTOMER...

We extend our congratulations to Wolverine Electric Cooperative's Johnson plant at Hersey, Michigan for being selected as the most efficiently operated REA internal combustion engine power generating plant in the nation for 1952. Two of the six dual fuel Diesel-generator units, installed in the Johnson plant, are cooled by Young Jacket Water Coolers. They provide dependable and efficient cooling for two 1010-hp Cooper Bessmer Diesel engines.

This is the second consecutive year that Young Radiator Company's Jacket Water Coolers provided a "winning combination" for operating efficiency.

Illustrated is a Young Jacket Water Cooler similar to the units installed at the Johnson plant. Young-developed, full-flow units feature vertical water flow, steel channel side members, steel side supports for cores, non-ferrous headers, etc.

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Heat Transfer Products for Automotive and Industrial Applications, Heating, Cooling and Air Conditioning Products for Home and Industry.
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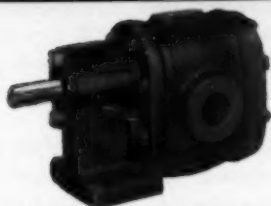


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Nos. 53 and 55

Rotary Geared Pumps




with Helical Gears and Antifriction Bearings

Long life is an important characteristic of these Brown & Sharpe Rotary Geared Pumps. Extremely accurate helical gears and precision antifriction bearings assure smooth, efficient operation at high speeds and under pressures up to 200 psi. Specially designed mechanical seal prevents leakage and eliminates gland adjustments.

Two sizes available—No. 53 with 4 to 23.3 gpm. capacity, and No. 55 with 9 to 34.1 gpm. capacity—at 0 lbs. pressure. Write for Pump Catalog listing complete line for diesel applications. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

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DIESEL ENGINE CATALOG

The purpose of this little advertisement is to tell you about Volume 17 of DIESEL ENGINE CATALOG which is now available, entirely revised and rewritten. This is the 17th edition of the book that has earned the name of "the bible of the industry."

All smart diesel engine salesmen carry this book around in their car. When they run into some new competition with which they are not too familiar, the DIESEL ENGINE CATALOG gives them full, accurate information when they need it most.

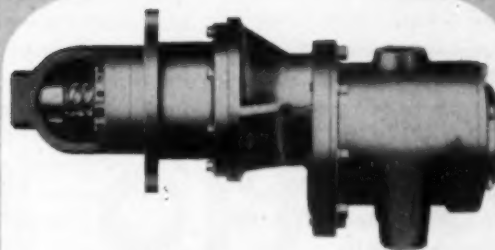
The consulting engineer keeps this book in his reference file. It immediately gives him all data on diesel engines coming within a given horsepower range, speed range and weight range.

People who sell, people who buy, people who use diesel engines need this new, fully illustrated, up-to-the-minute volume. It has been completely revised and expanded. Orders are now being accepted for this latest edition. Price \$10.00 prepaid.

Add California Sales Tax for Delivery in That State

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INGERSOLL-RAND

Air **STARTING MOTORS**

give you trouble-free

Engine Starts!

RELIABLE—Whatever the weather, I-R Air Starting Motors are built to give you ample power for fast, sure engine starting—anywhere.

LOW COST—No batteries, generators or electrical parts to buy or replace... and practically no maintenance expense.

COMPACT—These, lightweight I-R Air Starting Motors are small (as little as 13" long) but *powerful*. They are available for all popular gasoline and diesel engine sizes.

EASILY INSTALLED—Mounting I-R Air Starting Motors is no problem to any mechanic. They're designed for quick installation and minimum maintenance.

Ask your engine distributor to show you the I-R Air Starting Motor line. Or write for Bulletin 5094A.

911-18A

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Inland River Reports

By DAVID I. DAY

ADMIRERS OF the M.V. *LaSalle* of the fleet of the Commercial Petroleum & Transport Company were elated when she made history being the first boat to pass through the internationally-publicized locks at Chain of Rocks Canal, St. Louis. She came up from New Orleans, headed for Chicago with 4,500 tons of sulphur. The *LaSalle* was built last year at St. Louis Shipyards and with her twin General Motors engines, 1800 hp., has made a most excellent reputation as a towboat.

THE new 1400-hp. *Aliquippa* of Jones & Laughlin growing diesel towboat fleet at Pittsburgh is pushing coal from the corporation's Vesta Mines, California, Pa., to the big J & L plants in Pittsburgh and Aliquippa. The boat has twin National Superiors, very neat and smooth-working diesel units. Three steamboats have now been replaced with diesel vessels for Jones & Laughlin.

WE HEAR the *Lin Smith*, 3000 hp. vessel of the Charles C. Smith & Company fleet, Houston, Texas, was seen recently pushing scrap up in the upper Ohio's Pittsburgh pools. Some think she was never so far up that stream before. She is a fine one built in 1946 at Nashville Bridge yards, using Cooper-Bessemer triplets.

THE Ohio River Company, Cincinnati, has been awarded a contract to move by river 3,100,000 tons

of coal annually for 15 years, a job making the company one of the biggest on inland rivers. The coal will be towed from the mines at Powhatan Point, O., downstream 150 miles to the big new Kyger Creek electric generating plant at Cheshire on the Ohio. The work will be done largely, it is anticipated, by two boats already famous in the coal trade—the *Charles R. Stevenson*, 2415 hp., Fairbanks-Morse engines, triple-screw; and the *Robert W. Lea*, 1600 hp., with twin General Motors, the boat built at the Hillman yards at Brownsville, Pa., in 1947.

THE *A. H. Truax* of the Mississippi Valley Barge Line, busy this winter out of Cincinnati on the Ohio, passed Evansville recently downstream. The report there was that the motor vessel was destined for St. Louis and resumption of her old Mississippi River traffic once the upper river open. The *Truax* is one of the best of her size, 1650 hp., twin National Superiors, built seven years ago at the Calumet yards, Chicago.

ONE OF THE biggest tows of steel seen this year was in charge of the M.V. *Lehigh* of the Union Barge Line, an upper Ohio, downstream tow of 17 heavily loaded barges of steel and seven or eight empties. Capt. H. W. Litton was piloting. The vessel is about eight years old and has a very excellent engine room featuring twin National Superiors, totaling with Kort Nozzle about 2800 hp.

IT WAS A pleasure to see the *Beaver*, using her old Nelsec engines, 350 hp., helping the *Liberty*

bring up a big gas tow past Parkersburg, West Va. This small pusher, once called the *Dravo 42*, is now the property of the Union Barge Line at Pittsburgh.

IN COMMON with most people we were a trifle surprised to see the *Chilli Simpson*, Simpson Towing Co., Charleston, Mo., far up toward the immediate Pittsburgh pools on the Ohio recently. She was headed downriver eventually to reach Orange, Tex., with three barges of benzol. The Cooper-Bessemer people have a fine advertisement in the engine room, twins totaling 2250 hp.

THE 900 hp. new *Louise* built at St. Louis Ship last year and the Paducah-built *Alice*, four years old, with a 500-hp. Fairbanks-Morse engine are taking care of a \$518,400 coal towing contract. The job undertaken by the owner of the boats, the Crounse Corporation, Paducah, is that of coal pushing to the Johnsonville Steam Plant of the Tennessee Valley Authority. The engine room of the *Louise* with one General Motors unit is a neat one.

THE POPULAR *Liberty* of the Union Barge Line has received new shafts and propellers at Dravo yards. This 2880 hp. General Motors powered boat was once known as the *Johnny Walker*.

ANOTHER General Motors towboat, *Coal King*, 1800 hp.—a leader in Upper Mississippi towing, is now at work on the upper Ohio frequently. She is the property of Mid-Continent Barge Line, Alton, Ill., built 1951 at Alexander Yards, New Orleans.

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Atlantic Flexible Metal Hose



- For **VIBRATION DAMPENING**
CORRECTING MISALIGNMENTS
EXPANSION, CONTRACTION
of Diesel Exhausts, Air, Fuel Lines
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SEAMLESS OR INTERLOCKING CONSTRUCTION
BRONZE, STEEL, STAINLESS STEEL— $\frac{1}{4}$ "-36" I.D.
with fittings as needed.

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VIKING PUMPS HELP ERIE RAILROAD SERVICE 448 DIESEL LOCOMOTIVES




Chicago **Marion** **Meadville** **Scranton** **Susquehanna** **New York**

Measuring pumps at Susquehanna fueling station

Fueling depots, equipped with units of two Viking heavy-duty, 300 gpm pumps, help the Erie diesel-powered passenger and freight trains maintain their fast schedules. There are three such depots on the main line between New York and Chicago. Included are additional Vikings to pump lubricating oils.

Meadville, Pa. fueling depot uses Viking pumps.

Diesel fuel handled by Viking pumps at Marion, O. depot.

For information on these units ask for bulletin 2501N.



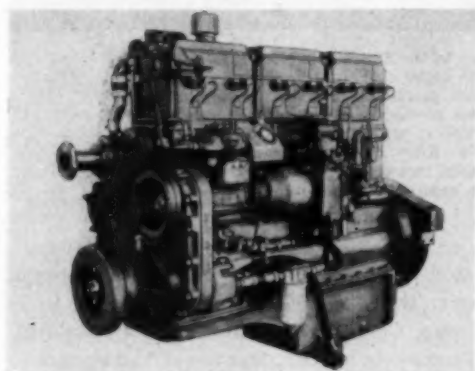
Viking PUMP COMPANY
Cedar Falls, Iowa

Marine Diesel Installation in Oregon

Captain Wilbur Smith of Rainier, Oregon is adding a new name to his fleet of tugboats. The new tug *Husky* was built for power and shallow draft. She is a triple screw craft powered by three GM Detroit Diesel Model 6-110 engines supplied by Gunderson Bros. Engineering Corp. of Portland, Oregon. Because of the design, this craft is able to pack 525 heavy-duty horsepower in a boat drawing only 49 inches.

Also in Oregon, the trawler *Nestucca* was recently repowered with a GM Detroit Diesel 6-110 marine engine. The power plant was supplied by Marine Equipment Company of Astoria, Oregon, Bud Conger, the owner, handled most of the installation himself at the Columbia River Packers Association shipyards in Astoria.

Increases Horsepower



In line with the continuous program to produce diesel engines with a maximum power-to-weight ratio, Cummins Engine Company, Inc., at Columbus, Indiana, announces the increase in horsepower rating of the HRBB-600 and HRBBI-600 engines. Power has been increased from 175 to 180 horsepower at 2000 rpm. with no increase in engine weight. The automotive version of this engine model—HRBB-600—is shown in the photograph.

Appointed President and General Manager

Appointment of Arch A. Warner as president and general manager of the Mechanics Universal Joint Division of Borg-Warner Corp. was announced by Roy C. Ingersoll, Borg-Warner president. Mr. Warner succeeds G. C. Gridley, who requested retirement as president but will be retained in a consultative capacity. Mr. Warner has been president and general manager of the Rockford Clutch Division of Borg-Warner since 1944. His successor to the managership of Rockford Clutch was not named immediately. As president of the Mechanics Universal Joint Division, Mr. Warner will head two Borg-Warner Universal Joint manufacturing plants, one in Rockford and the other in Memphis.

"We are very pleased," Mr. Ingersoll said, "that after receiving Mr. Gridley's request for retirement, Borg-Warner is able to replace him with another Rockford executive of many years' service. Mr. Warner not only has a background of over eight years' managerial experience with Rockford Clutch,

but when he first came to Rockford in 1941 it was as assistant works manager of the Mechanics plant. Therefore he knows that division's operation intimately and will return to work with a host of former colleagues.

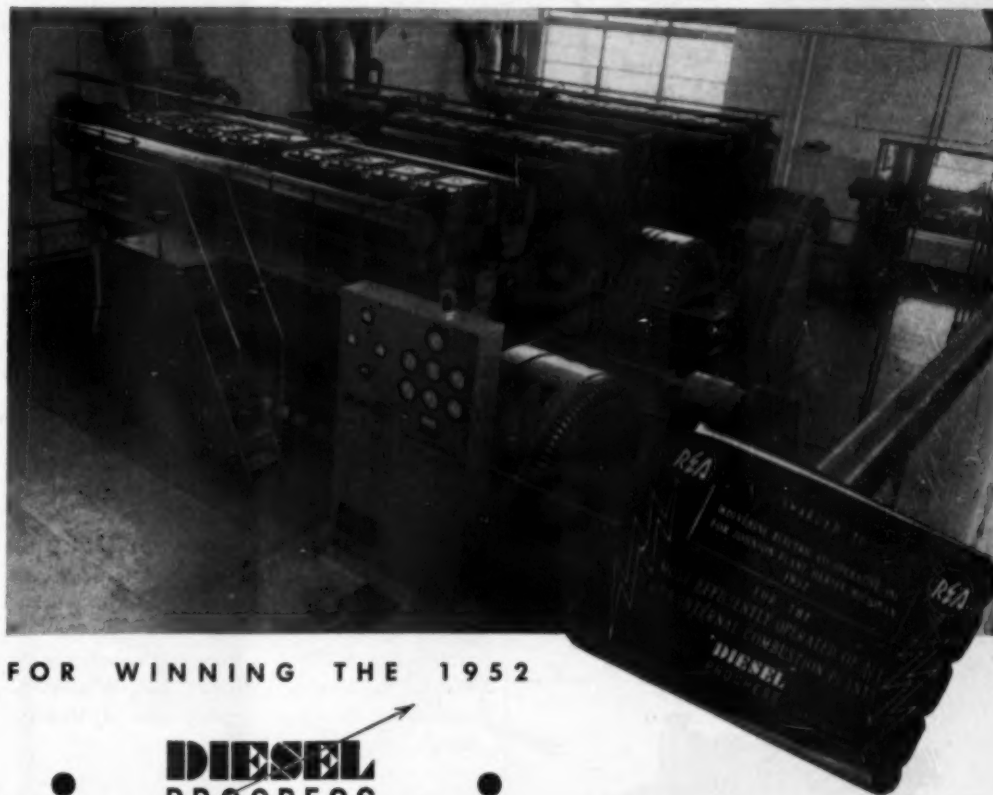
Offers Brochure on Gas Meters

A new 16-page booklet on meters for measuring gases of any type, and in quantities from 4,000 to 1,000,000 cubic feet, has been published by Roots-Connersville Blower Division of Dresser Industries, Inc. "If you manufacture gas for sale, or if you purchase it from outside sources," says the brochure, "your metering must be cash-register accurate to avoid undercharges and overcharges.

If you distribute gas within your plant, you want to be sure of precise cost accounting. If production depends upon correct proportioning of gas, accurate measurements are still more vital. In short, for whatever purpose you meter air or any kind of gas, permanent accuracy is a basic requirement for successful performance."

In addition to detailed descriptions and illustrations of meters of various types, the booklet contains a useful selection table to determine the meter required for any load, whether at standard or variable conditions of temperature and pressure. Copies of the brochure, called Bulletin M-152, are available from Roots-Connersville Blower, Connersville, Indiana.

HATS OFF to WOLVERINE ELECTRIC CO-OPERATIVE JOHNSON PLANT, HERSEY, MICHIGAN



FOR WINNING THE 1952

**DIESEL
PROGRESS
AWARD**

BRIGGS OIL FILTERS Briggs

THE COOPER-BESSEMERs shown above are Briggs equipped. We are proud to play a part in this outstanding installation.

AGAIN, WE SAY, HATS OFF TO WOLVERINE!

THE BRIGGS FILTRATION CO., RIVER ROAD, WASHINGTON 16, D.C.

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Flexible ALL METAL
COUPLINGS
FOR POWER TRANSMISSION
REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for misalignment and end float.

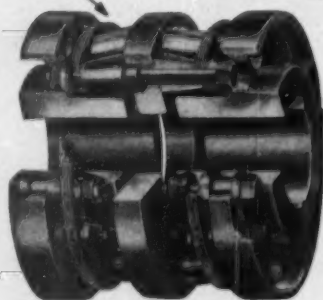
Thomas Couplings have a wide range of speeds, horsepower and shaft sizes:

1/2 to 40,000 HP
1 to 30,000 RPM

Specialists on Couplings for more than 30 years

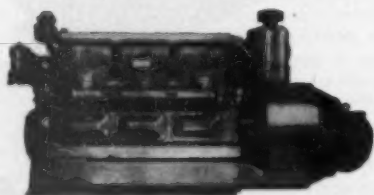


PATENTED FLEXIBLE DISCS



THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT. NO MAINTENANCE PROBLEMS.

ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



FOR SUCH TOUGH JOBS AS: DIESEL COMPRESSOR DRIVES, MARINE MAIN DRIVES, LOCOMOTIVE MAIN DRIVES, AUXILIARY DRIVES, ETC.

Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA



Presentation of the Colonel Robert H. Morse Cup to the Cincinnati branch sales organization. Here, the Colonel, who is chairman of the board of Fairbanks, Morse & Co. and after whom the beautiful silver trophy was named, personally presents the Cup to John S. King, Cincinnati branch manager. Others in this photo are (seated): O. O. Lewis, vice president-sales; Mr. King; Colonel Morse; and Robert H. Morse, Jr., president of Fairbanks-Morse. Standing are (left to right): Philip L. Riley, honor salesman; W. B. Morse, Detroit branch manager; J. A. Cuneo, general sales manager; R. H. Morse III, general manager, Beloit, Works; and Henry J. Barbour, manager, sales promotion and public relations.

Annual Fairbanks-Morse Award

A new silver trophy for top sales performance in 1952 was presented recently to John S. King, manager of the Cincinnati Branch of Fairbanks, Morse & Co., Chicago manufacturers of diesel engines, locomotives, scales, pumps and electric machinery, at a special dinner given in the Continental Room of the Netherland Plaza Hotel, Cincinnati. The Colonel Robert H. Morse Cup, as the new trophy is called, was presented by Colonel Morse himself, Chairman of the Board of the Company, to Mr. King and his Cincinnati sales organization. About ninety guests attended the celebration. Twenty years ago Colonel Morse first awarded a trophy called the President's Cup to the branch house enjoying the largest volume of sales in relation to its annual quota. During this period the Cup has been awarded to ten of the company's sixteen branches. This is the first time the Cup was won by the Cincinnati Branch. Philip L. Riley, top salesman of the year for the Cincinnati Branch, had his name inscribed on the Cup alongside that of Manager King's.

In 1865, Charles Hosmer Morse the First set up in Cincinnati a branch of Fairbanks, Greenleaf & Co. of Chicago, to sell Fairbanks scales and other products. The branch was called Fairbanks, Morse & Co. and this was the first time the corporate name of the company, as it appears today, was used. In honor of winning the Cup, and because of this sentimental and historical interest, three generations of the Morse family attended the gala event. These were: Colonel Robert H. Morse, Chairman of the Board; Robert H. Morse, Jr., President; Robert H. Morse, III, General Manager, Beloit, Wisconsin, Works; and William B. Morse, Manager of the Detroit, Michigan, Branch House. Other

officials and executives of the company present were: O. O. Lewis, Vice President-Sales; J. A. Cuneo, General Sales Manager; A. L. Stoddard, Secretary; O. S. Leslie, Manager of Manufacturing; Henry J. Barbour, Manager, Sales Promotion and Public Relations; C. G. Gehringer, Sales Manager, Scale Division; and A. L. Decker, Vice President, Buchen Advertising Co.

Sales Promotion Manager

Appointment of Donald C. Huber as sales promotion manager of Purolator Products, Inc., oil filter manufacturer, Rahway, N. J., has been announced by Carlos D. Kelly, vice-president in charge of sales. Decision to establish a sales promotion department at Purolator, which will operate under the supervision of the advertising department, is another step in the company's intensified sales and promotional program on its fuel, lubricating oil and other types of filters for automobiles, aircraft, farm implements, and industrial uses. Formerly assistant advertising manager for Purolator, Mr. Huber is a resident of East Orange, N. J., where he received his early education at the East Orange High School. He later attended Louisiana State University, Drexel Institute of Technology, and Seton Hall University, South Orange, N. J. Mr. Huber is a veteran of World War II and saw overseas service with the 11th Armored Division in the E.T.O. Before joining Purolator Products, Inc., in 1951, he was director of merchandising and sales promotion for Arthur Cohn & Associates, New York.

YOUR COPY OF DIESEL ENGINE CATALOG in its seventeenth completely re-edited, revised and expanded edition is now available. An invaluable aid to design engineers and buyers, it incorporates the latest diesel engine specifications and descriptions. Order your copy of this limited edition now. Profusely illustrated. \$10.00. Mail checks to DIESEL PROGRESS, 816 North La Cienega Blvd., Los Angeles 46, California.

DIESEL PROGRESS

Florida Diesel News

By ED DENNIS

MURPHY powered, the newly launched 52 ft. trawler *Cynthia Maria* is really a trim craft; specifications are a Murphy 125 hp. diesel engine, Twin Disc reverse and reduction gears and power take-off, Delco Remy starters and generators. Capt. Felix Wiseman is the proud owner.

PRODUCTOS Refrigerados, S.A., one of the modern shrimp packers of Campeche, Mexico, has an attractive engine room at their freezing plant. 4 Worthington 7x7 compressors powered by three GM diesel 60 kw. generating units. Producing for this plant are a fleet of 18 Florida type trawlers powered with GM and Caterpillar diesel engines.

KENNEDY Marine Engine Co. supplied the model 110 General Motors 275 hp. diesels for the newly launched *Mary Carolyn* and *West Wind*. Also re-powered the *Beatrice*, a menhaden fish boat with a set of twin GM 110's.

BISCAYNE Annex, the largest post office building in the south, received a twin General Motors 6-71 diesel unit connected to a 250 kw. Crocker Wheeler generator for standby emergency use; from Peninsular Armature Works.

RECENT additions to the Mexican shrimp fleet are the *Santa Lucia* with a 150 hp. Enterprise diesel, the *Barracuda* and *Don Jorge* with GM 6-71's, the *Marlin* with a D13000 Caterpillar and the *Churumbel* with a GM 6-71 diesel engine and GM hydraulic marine gears 3:1 ratio.

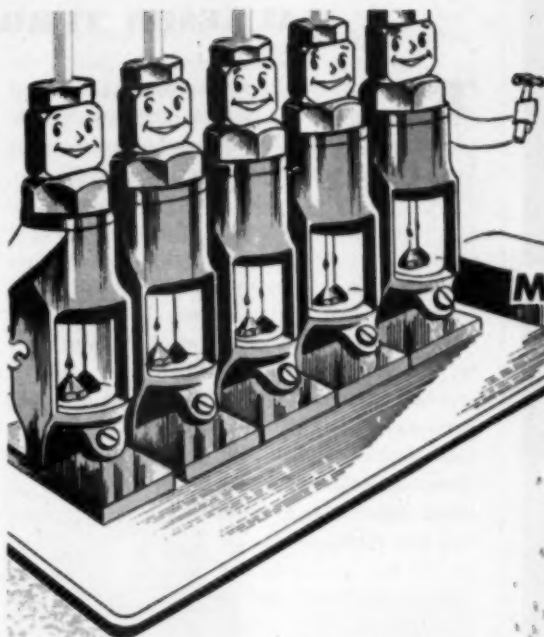
AT COCONUT Grove the Royal Palm Ice Co. operates a modern ice plant with 3 Fairbanks-Morse 225 hp. diesels belted to three 12x12 Frick compressors; other specifications are two 15 kw. GE and one 63 kw. FM generator, Burgess Manning air breathers, Worthington transfer pumps, Madison Kipp lubricators, Belcher fuel oil. The capacity is about 125 tons of ice daily.

ALL FLORIDA is still talking about the 7 day record breaking attendance at the GM Motorama in Miami, with its diesel exhibits of Electro Motive and Detroit Diesel Div., three times as large as the New York show, its attendance of 321,500 was also greater than in New York.

SEABOARD Air Line Railroad will spend \$7,600,000 for new equipment, among which will be 31 diesel locomotives and 600 all steel gondola cars. Supervisors and engineers are undergoing instructions on the new American Locomotive diesels.

MAYAGUANA, British West Indies, recently received 2 model 89C.P. 8 cyl. Chicago Pneumatic diesel engines, 350 hp. at 750 rpm. for generating purposes.

FERNANDINA is the home port for the trawler *Haze*, repowered with a 6 cyl. Sterling diesel model MRDB-6, 170 hp., Snow Nabstedt reduction gears, 44x34 propellers, Capt. Dave Cook, owner. Diesel Marine Engineers, Jacksonville handled this fine installation.



Manzel

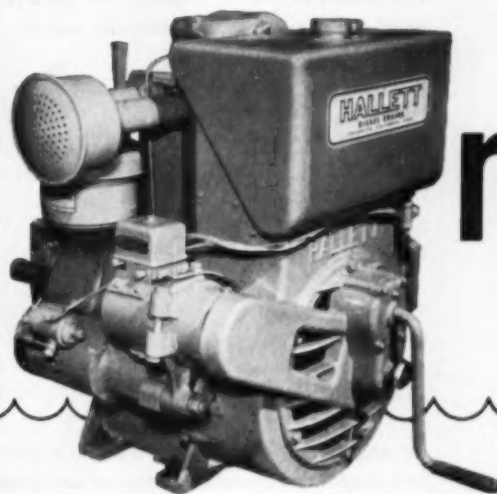
MECHANICAL MAINTENANCE MEN

- SAVE LABOR
- REDUCE WEAR
- PREVENT BREAKDOWNS
- SLASH OIL CONSUMPTION
- ELIMINATE DOWNTIME

Automatic force feed lubrication by Manzel provides a sure way to *lengthen* the life of machinery and reduce operating costs. Manzel Lubricators unfailingly supply *exactly* the amount of oil needed at each wearing point *and no more*. They are furnished as standard equipment on leading makes of engines and machinery, or they can be installed on your present equipment. Write now for full information.

Manzel

275 Babcock Street, Buffalo 15, N. Y.



rugged

All Hallett Diesels are built to last and last. Camshafts are heat treated Meehanite—Crankshafts and connecting rod of forged molybdenum steel—Cylinder and head cast in one piece from special molybdenum iron—Silichrome steel valves—Bronze valve guides—Heat treated Meehanite Camshaft gear.

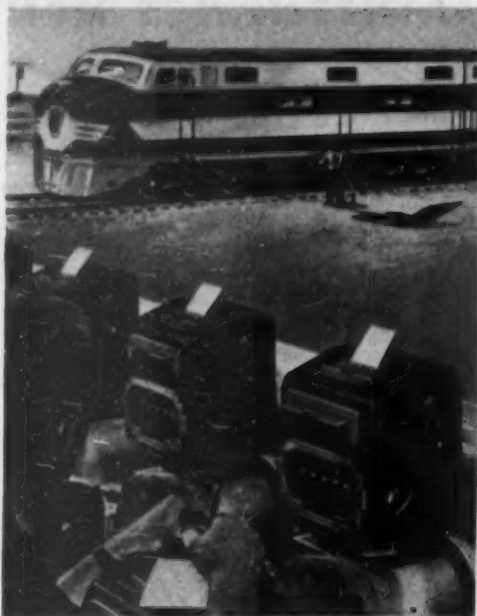
Rugged, heavy-duty 4-cycle design makes the 5 H P Hallett Model AC-1 the choice of fishermen everywhere. Other models to 18 HP.

Write today for booklet.



HALLETT MANUFACTURING COMPANY
World's Finest Low Horsepower Diesel Engines
1601 WEST FLORENCE AVENUE • INGLEWOOD, CALIFORNIA

THE ROCKWELL Remote Registration System For Fueling DIESEL LOCOMOTIVES



CUTS COSTS • STOPS LOSSES IMPROVES ACCOUNTING

Remote registration of fuel loaded into Diesels can offer you some startling advantages and savings. First you put the sole control over all metered outlets in the hands of one supervisor. He operates from a control room overlooking the entire fueling area. No fuel can be drawn until he inserts a ticket in the proper printing register and activates the matching electric circuit. At the completion of the fill the unalterable ticket shows the exact gallonage loaded.

In addition to providing positive proof of actual deliveries, carbons of these remotely printed tickets can be used for inventory control, to verify tax payments and to form the basis for a completely mechanized accounting procedure.

HOW THIS BETTER SYSTEM WORKS

The row of office printing registers (shown in main illustration above) is electrically synchronized to standard registers on Rockwell Rotocycle meters in the fueling pits outside. Each office register is permanently interlocked to one meter register and all gallonage dispensed by that meter is accurately recorded, then printed under the direct, watchful control of the dispatcher. The entire system bears the Underwriters' Laboratory seal of approval.

WRITE FOR
BULLETIN
OG-324



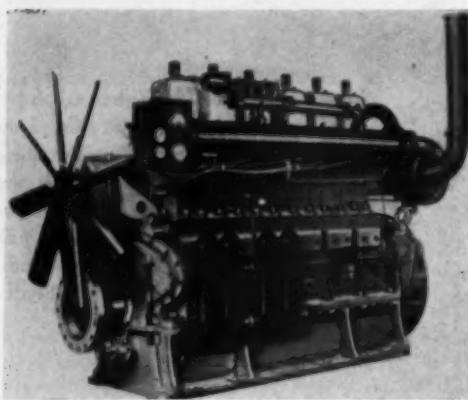
ROCKWELL MANUFACTURING CO.
Pittsburgh 8, Pa.



This ticket is sealed into and printed by the remote register. It guards against human errors, debits and losses—provides permanent indisputable records for inventory control, cost and tax accounting.

WAUKESHA TURBOCHARGED DIESELS

THE Waukesha Motor Company has extended the advantages of turbocharging to relatively small engines. It has been among the first to exploit the fairly recent availability of commercially produced small turbochargers of small size, and is the first of the engine builders to offer a turbocharged engine having only 426 cu. in. displacement. Turbochargers have been applied to five basic diesel engine sizes, three for transportation or industrial service and the two largest as complete power units for industrial service. The 1197 cu. in. model is supplied either as a bare engine or complete unit. Extension of turbocharging into this light-weight, high-speed engine field is in the nature of a milestone and could well have lasting and far-reaching effects. Application to transport engines is particularly noteworthy.



The 6-cylinder turbocharged Model LRDS develops 570 hp. at 1200 rpm.

The models now being produced are listed below, showing stripped engine maximum power.

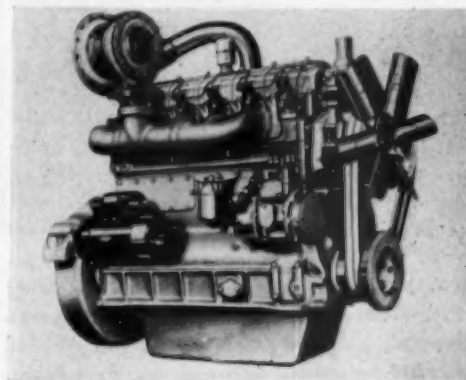
Model	Cyl.	Bore and Stroke		Displ.	Hp.	Rpm.
135-DKBS	6	4 1/4 x 5		426	185	2800
148-DKBS	6	5 1/4 x 5		779	280	2100
WAKDS	6	6 1/4 x 6 1/2		1197	352	1800
NKDS	6	7 x 8 1/4		1905	380	1200
LRDS	6	8 1/2 x 8 1/2		2894	570	1200

The turbocharged ratings represent power gains from 147, 200, 225, 298, and 406 hp. respectively. All of the engines are heavy-duty, six-cylinder, four-stroke cycle units.

All engines incorporate the Waukesha spherical fuel combustion chamber. Design of the spherical cavity and the tangential throat opening into the main combustion chamber promotes controlled turbulence and aids in obtaining clean, complete combustion. An insulating air space surrounds the lower half of the combustion chamber and the retained heat is given up to the air during compression. This reduces ignition lag and since the amount of heat retained will vary with the load, this feature has the effect of advancing or retarding the time of combustion. The upper half of the chamber, including the injector mounting bore, is water-jacketed.

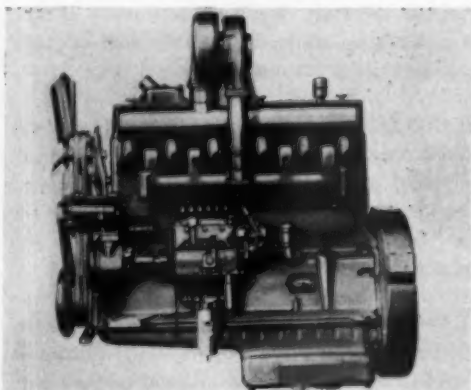
All Waukesha turbo-charged diesels use American Bosch injection equipment suited to the engine

size. Single orifice, pintle-type nozzles are standard. The Model 135-DKBS, of 426 cu. in. displacement, uses a single-plunger, flange-mounted injection pump, and the four larger models use the multi-plunger, bracket-mounted pump. Variable speed centrifugal governors, mounted on the injection pumps, are used on the Model 135-DKBS (426 cu. in.), Model 148-DKBS (779 cu. in.), and Model WAKDS (1197 cu. in.). The larger NKDS (1905 cu. in.) and LRDS (2894 cu. in.) have centrifugal type governors operated through the engine gear train.



Output of the 6-WAKDS has been boosted from 225 hp. to 352 hp. by turbocharging.

Turbochargers are of two designs, the Schwitzer-Cummins turbo being used on Model 135-NHBS and the Elliot turbo as standard equipment on the four larger models. On the three smallest engines the turbo is ordinarily top-mounted on the exhaust manifold. On the two large industrial units the turbo is mounted on the rear end of the exhaust manifolds. At top engine speeds, the rotating elements of these turbochargers turn at a speed that may go as high as 35 to 40 thousand revolutions a minute.



The turbocharged Model 135-DKBS diesel develops 185 hp. at 2800 rpm.

All the features that contribute to the long life and reliability of Waukesha diesels are contained in all the turbocharged models. Cylinder liners are of special alloy; connecting rods are heat-treated drop-forgings; pistons are heavy duty design; bearings are precision type, and replaceable; wedge-top rings are chrome-plated; water and oil are heavy duty built-in types; Stellite faced valves and Stellite inserts are standard; full pressure lubrication is common to all models; drop-forged, extra-heavy crankshafts with large-diameter hardened and

ground journals, are furnished with or without counterbalancing, depending on service requirements.

The advantage of using the waste energy in exhaust gases to supply a more dense charge of air to the engine has long been recognized. In the case of the relatively small truck and transport engines this has not been possible until fairly recently due to the absence of small turbochargers for mass production. Older turbocharger designs were not so responsive to speed changes, and as a result, acceleration characteristics of the engine suffered. Current design improvements involving lighter rotating parts, improved bearings, better metals, and more efficient turbine and compressor design have largely solved this difficulty.

The primary reason for turbocharging is to obtain higher specific output from an engine. This means a better horsepower/weight ratio, improved mechanical efficiency, and as a result of the latter, better fuel efficiency. Waukesha has achieved all of these advantages. The specific gains in horsepower with no sacrifice in dependability are of prime importance. All of the engines show lively acceleration, clean burning with all standard diesel fuels, an excellent reserve of power, and improved overall economy.

Free Oil Log Offered

The Fleck Engineering Company, Inc., 1631 Filbert St., Baltimore 26, Maryland, is offering free

upon request their unusual "Re-Fleck-Tor" oil recorder log. This handy log book provides for an accurate check on daily conditions of oil, shows when filter changes are necessary indicates the presence of water and fuel dilution and provides a complete log of diesel operating conditions among other information. The Fleck Engineering Company manufactures high quality replacement filters. This organization specializes in solving special filtering problems in addition to supplying replacement filters for all types of diesel engines.

Named Manager



R. W. Walker

R. W. Walker, a vice president of Mack Motor Truck Corporation, has been named manager of the company's bus division, it is announced by H. W. Dodge, executive vice president. Mr. Walker first became associated with Mack in 1924 and during the late twenties was responsible for the sales of many of the first buses used by the major bus companies of New York. In 1930 he converted the Grand Street and Avenue B street cars in New York City to bus operation. He has served the company as sales manager of various district and division offices. Mr. Walker will make his headquarters in Mack's home office, Empire State Building, New York City.



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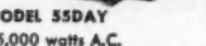
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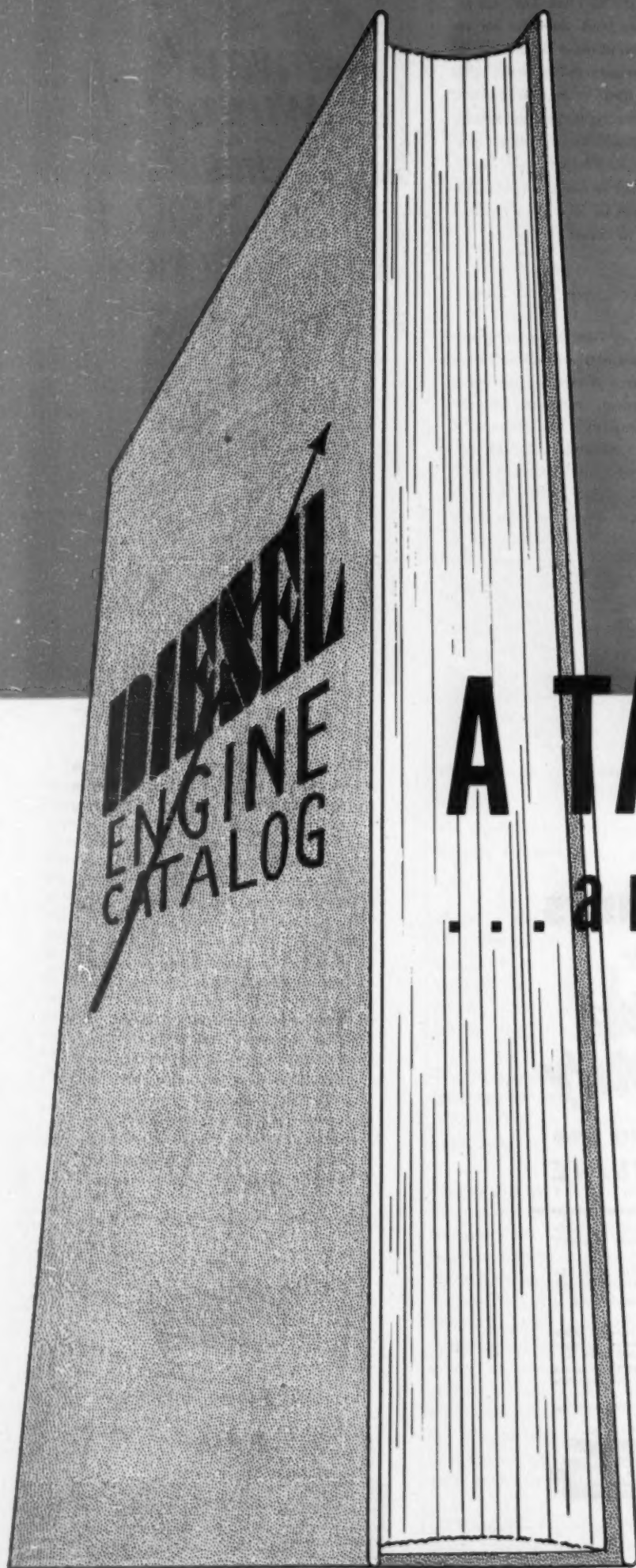
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tion describing engine and plant accessories. (3) A transmission section describing torque converters, etc. (4) A classified buyers guide giving valuable information as to the source of many items you buy in the diesel industry. (5) The advertising section which further details the manufacturer's product.

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Gulf Coast Diesel News

By MICHAEL T. PATE

A GENERAL Motors twin-four torque converter diesel, Series 71, has been bought from Stewart Stevenson Services, Inc., Houston, by the Pure Oil Company for driving through silent chain on Oil-well 2-12 pump. This engine is equipped with insulated exhaust manifolds, water-cooled mufflers, spark arrestor and static-free belts are used to drive fan and generator. This unit is intended for servicing oil and/or gas wells under hazardous conditions.

WADE LEHAR, Mountain Home, Arkansas, contractor who has the job of cleaning out the reservoir basin for Houston's San Jacinto River dam flood basin, bought from Browning-Ferris, Houston, three International Harvester TD 24 diesel crawler tractors with bulldozer blades and special brush protection frames for the job.

CAPTAIN John Santos Carinhas, Port Arthur, Texas, bought from Sabine Propeller and Marine Service Co. of Port Arthur six series 110, General Motors marine propulsion engines. He will install two in a twin-screw shrimp boat, and two each in a pair of twin-screw porgy boats.

SAM Howell Drilling Company, Alice, Texas, has bought from Stewart & Stevenson Services, Inc., a General Motors twin four. The unit will drive a 4 in. centrifugal pump, a 4x6 in. reciprocating pump, and 5 kw. and 10 kw. dc. generators. Total horsepower requirements are 80, with the twin four providing 100% stand-by power.

GULFPORT Shipbuilding and Drydock Co., Port Arthur, Texas, has purchased through Buda Engine & Equipment Co., Houston, two single-cylinder, 7-hp., 3-kw. battery charging sets to be installed in tugs for the Higman Towing Company, Orange, Texas.

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INGALLS Shipbuilding Company, Pascagoula, Miss., has secured from Buda Engine & Equipment Co., Houston, three 100-kw. diesel generator sets and one 60-kw. set, all Buda powered, for installation in a refrigeration barge being constructed for the Army Transport Corps.

LIGHTHOUSE, Inc., Houston, has purchased two 25-kw. Buda diesel generator sets which it is making up into packaged units for portable powerhouse service on offshore installations by the Sun Oil Company. The diesels came through Buda Engine & Equipment Co., Houston.

BANKS, Moreland Company of Houston and Graver Tank & Manufacturing Co., Hammond, Ind., have taken delivery of a joint order for 20 dieselized welding generator sets for tank construction. The units are powered by a two-cylinder General Motors diesel, rated at 47 hp. Delivery was made by Big 3 Welding Equipment Co., Houston.

RUSS Mitchell, general contractor of Houston, has bought from Buda Engine & Equipment Co. one 75-hp. Buda diesel to replace the former power plant in a 3/4-yard shovel.

BURTON Shipbuilding Company, Port Arthur, Texas, has bought through Sabine Propeller and Marine Service Company of that city two General Motors 20 kw. ac. generator sets, powered by GM diesels, to be used on a boat building at that company's yard.

S. & R. Tool Company, of Houston, is installing a series 110, heat-exchanger cooled General Motors diesel to drive a 100 kw. dc. generator in an LST being outfitted for offshore service for Gulf Oil Company.

HALLIBURTON Oilwell Cementing Company, Duncan, Oklahoma, has purchased ten General Motors series 71 diesels, to be used on as many Howco T-10 oilwell cementing pumps.

IMMEDIATE NEED for Diesel Electric Plant installation and service men with experience on 15 through 100 KW units. Positions overseas. Salaries \$7800 and up plus \$6 per diem.

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Oil and Gas Power Division Celebrates Silver Anniversary

The Oil and Gas Power Division, ASME, will celebrate its silver anniversary this year. Its 25th annual Conference and Exhibit will be held in the Schroeder Hotel, Milwaukee, Wis., May 25-28. Everyone interested in diesel, dual fuel and gas engines should attend. The program promises refreshment on design, operating, and maintenance development and ample opportunity to meet old and new friends. Between technical sessions interest focuses on some forty-five to fifty exhibits of engines and accessories.

Here are some of the technical papers to be presented and discussed: "Valves for High Output Engines," by Messrs. Allen and Newton of Thompson Products, Inc.; "Investigation of Flame Temperatures in Single Cylinder Spark-Ignition Engines," by J. H. Potter and R. B. Dillaway, University of Illinois; "Two and Four-Cycle Test Results of Medium Speed Engines on Heavy Fuel," by Russell Pyle, D. C. Cryor and J. M. A. Van der Horst, of Van der Horst Corp. of America; "Residual Fuel Production and Utilization in Diesel Engines," by Messrs. Harbermann, Albright and Killingsworth, Socony Vacuum Co.; "Packard Marine Diesel" by Maraden Ware, Packard Motor Car Co.; "The Tuned Manifold on Supercharging Without a Blower," by H. W. Engelman, University of Wisconsin; "Crankshaft Notes, with Particular Reference to Crankwebs, Including Arcweb Design," by S. W. Newell, Union Diesel Engine Co.

This fine combination of theory and practice to be covered in technical sessions will be supplemented by inspection trips to several of Milwaukee's leading industries. The Milwaukee section of ASME is noted for its hospitality. A fine program is planned for women. Make your reservations early—mention the Oil and Gas Power Conference if you want to stay at the Schroeder.

Diesel Fuel Ignition Improver Commercially Available

Following extended tests with the U. S. Navy, the Ethyl Corporation is making its ignition improver for diesel fuels commercially available. (For a description of this ignition improver which is a mixture of primary amyl nitrates, see the November 1952 and May 1952 issues of DIESEL PROGRESS.)

Shipments of this new diesel fuel additive will be made in tank car and 55-gallon drum quantities and will be distributed from both the east and west coasts. The blending of the additive with diesel fuel is a relatively simple operation and can be done economically without any unusual safety precautions at either the refinery or at the storage terminal.

YOUR COPY OF DIESEL ENGINE CATALOG in its seventeenth completely re-edited, revised and expanded edition is now available. An invaluable aid to design engineers and buyers, it incorporates the latest diesel engine specifications and descriptions. Order your copy of this limited edition now. Profusely illustrated. \$10.00. Mail checks to DIESEL PROGRESS, 816 North La Cienega Blvd., Los Angeles 46, California.

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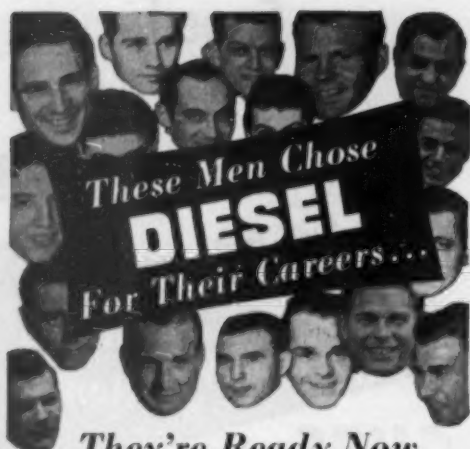
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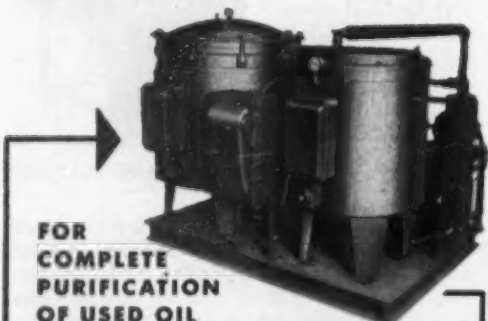
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GM Detroit Diesel Appointments



Ernest F. Bentley



Robert W. Baxley



John C. Campbell



Louis A. Steele

The appointment of Ernest F. Bentley as general sales manager of the Detroit Diesel Engine Division of General Motors has been announced by W. T. Crowe, general manager of the Division. Mr. Bentley succeeds V. C. Genn whose death occurred in January. Mr. Bentley's association with General Motors dates from 1934 when he started as an engine designer with the Winton Engine Corporation of Cleveland, which later became the Cleveland Diesel Engine Division. He came to Detroit Diesel in 1940 as project engineer and prior to his present appointment was operation sales manager. He also served as staff assistant to the general manager, production buyer, supervisor of Control Materials and manager of Manufacturers' Sales. Other appointments which have been announced by Mr. Bentley, include Robert V. Baxley, as operations sales manager; John C. Campbell, as manager of Manufacturers' Sales and Louis A. Steele, as industrial sales manager.

Mr. Baxley, former Contractors' Equipment Sales Manager, started with General Motors as a sales engineer in 1939 and a year later joined Detroit Diesel as an experimental engineer. Mr. Campbell

came to the Division from Frigidaire in 1942 and has served as Advertising and Sales Promotion Manager and Industrial Sales Manager. Mr. Steele has been with Detroit Diesel since 1942, serving as Distribution Manager, Manager of the Contract and Order Section and Automotive and Tractor Sales Manager.

Appoints Three Representatives

The Burlington Instrument Company of Burlington, Iowa has announced three representatives in various parts of the country. The Young and Myers Company of 4550 Main St., Kansas City and 8147 Delmar Blvd., St. Louis, Mo. will represent Burlington in Kansas, Missouri and Southern Illinois. The Robert E. Brown Company, 311 Ross St., Pittsburgh 19, Pa., will handle Burlington in the western half of Pennsylvania and the entire state of West Virginia. The Harry A. Lasure Company, 9041 West Pico Blvd., Los Angeles, California will cover Southern California, Arizona and Nevada.

New 47-Ton Coal Hauler



A fleet of ten Euclid coal haulers of 47-ton capacity, built of special high strength alloy steel, has been delivered to the Hanna Coal Company. To be used at Hana's Georgetown mine near Cadiz, Ohio, the units are the largest ever built by the Euclid Road Machinery Company. The tractors are powered by 350 hp. Buda diesel engines and the trailers are built of a special manganese, nickel, copper, alloy steel noted for its high tensile strength and resistance to abrasion. Other unusual features include spring mounting of the trailer and use of nylon cord tires of 28 ply rating. Dual trailer and drive tires are 18 by 25.

Pay load capacity is 94,000 lbs. or 62 cu. yds. struck and 70 cu. yds. heaped at a 3 to 1 slope. Length of tractor and trailer is 52 feet, 5 inches. Equipment includes a 10 speed transmission, air assist clutch, and hydraulic booster steering.



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West Coast Diesel News

By FRED M. BURT

INSTALLED by Signal Oil & Gas Co. at their Huntington Beach, Calif., field, two 660-hp. Clark natural gas engine driven compressors for use in boosting line pressure; both cooled with a single Vapor Phase unit, thermal circulation with no pumps.

INSTALLED for booster station on water supply system for Navy on Santa Cruz Island, Calif. two 20-hp. Buda diesel engines direct connected to Deming pumps from Simonds Machinery Co., Los Angeles.

PURCHASED by Utah Construction Co. for use near Lima, Peru in iron mine operation, pulling large dump body ore trailers, 20 Kenworth truck tractors powered with 6-cyl., 300-hp. Cummins diesels.

ARRIVING AT Wilmington, Calif. on her maiden trip, from Oslo, Norway, the new Norwegian motorship *Buffalo*, Fred Olsen Line, 9500-tons capacity, 465 ft. long, is powered with a 10,500-hp. @ 117-rpm., 7-cyl. Akers diesel engine for 17 knots speed.

AT EACH location, for boosting line pressure, two 330-hp. Ingersoll-Rand natural gas engine driven compressors have been installed for Shell Oil Co. at Brea, Calif.; Union Oil Co., McKittrick, Calif.; also at latter, one 220-hp. I-R compressor.

A NEW 500-hp. Buda diesel driving a 330-kw. generator to supply power for Baltimore-Camas Mines, Ely, Nevada, is equipped with a Vapor Phase unit to recover waste jacket heat for use in heating mine buildings.

A 375-HP. NATURAL gas engine driven Cooper-Bessemer compressor recently installed by Steele Petroleum Co. at Coalinga Nose, Calif. is being used for gas line pumping.

PURCHASED BY Watson E. Jarrett, Altadena, Calif., excavating and grading contractor, the latest

model Lima 2½ yd. shovel powered with a 250-hp. Cummins diesel driving through a Torcon converter; in use on an earth fill project at Long Beach Harbor.

PURCHASED BY Guy F. Atkinson Co., general contractor, 30 Euclid, 20-ton capacity, end dump trucks powered with 300-hp., supercharged Cummins diesels, for use in the Philippine Islands on dam construction.

FOR POWER in new 65 ft. sport fishing boat *Del Mar*; owners McCullah Bros., Donaldson & Dittmar, Oceanside, Calif., a 170-hp. Caterpillar marine diesel.

FROM Buda Engine & Equip. Co., Los Angeles for the City of Oxnard, a 40-hp. Buda natural gas engine to power Fairbanks-Morse sewage pumps.

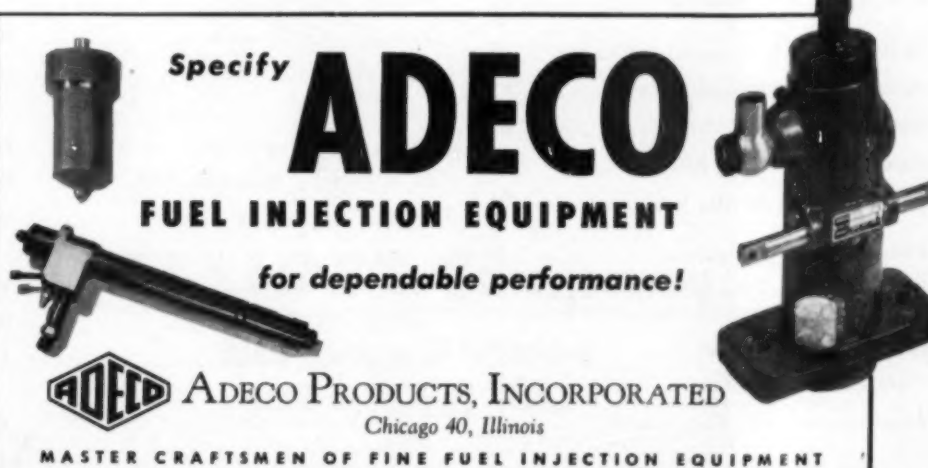
ADDED TO fleet of California Portland Cement Co., headquarters Los Angeles, six new Diamond T trucks powered with 200-hp. Cummins diesel engines.

INSTALLED AT Union Oil Co. pumping station, Santa Paula, Calif., two 330-hp. Clark and one 330-hp. Cooper-Bessemer, natural gas driven compressors; all three units cooled with one Vapor Phase unit.

SUPPLIED BY Shepherd Tractor & Equip. Co., Los Angeles for Morrison-Knudsen Co., a 500-hp., 12-cyl. Caterpillar diesel driving a 300-kw. generator to supply power and lighting on a dam construction projects at Navajoa, Sonora, Mexico.

PURCHASED BY Alper & Alper, scrap metal dealers of Los Angeles, an 80-hp. Caterpillar diesel to repower a Lorain crawler crane with skeleton bucket, replacing a gasoline engine.

A NEW 440-hp. Ingersoll-Rand natural gas engine driven compressor installed by United Gas Company at their Corpus Christi, Texas plant uses a Vapor Phase unit for the cooling system, with the low pressure steam derived from the waste heat driving a steam turbine fan to condense the steam back to water.



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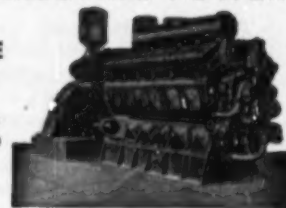
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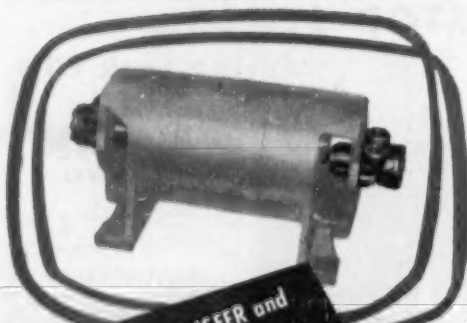
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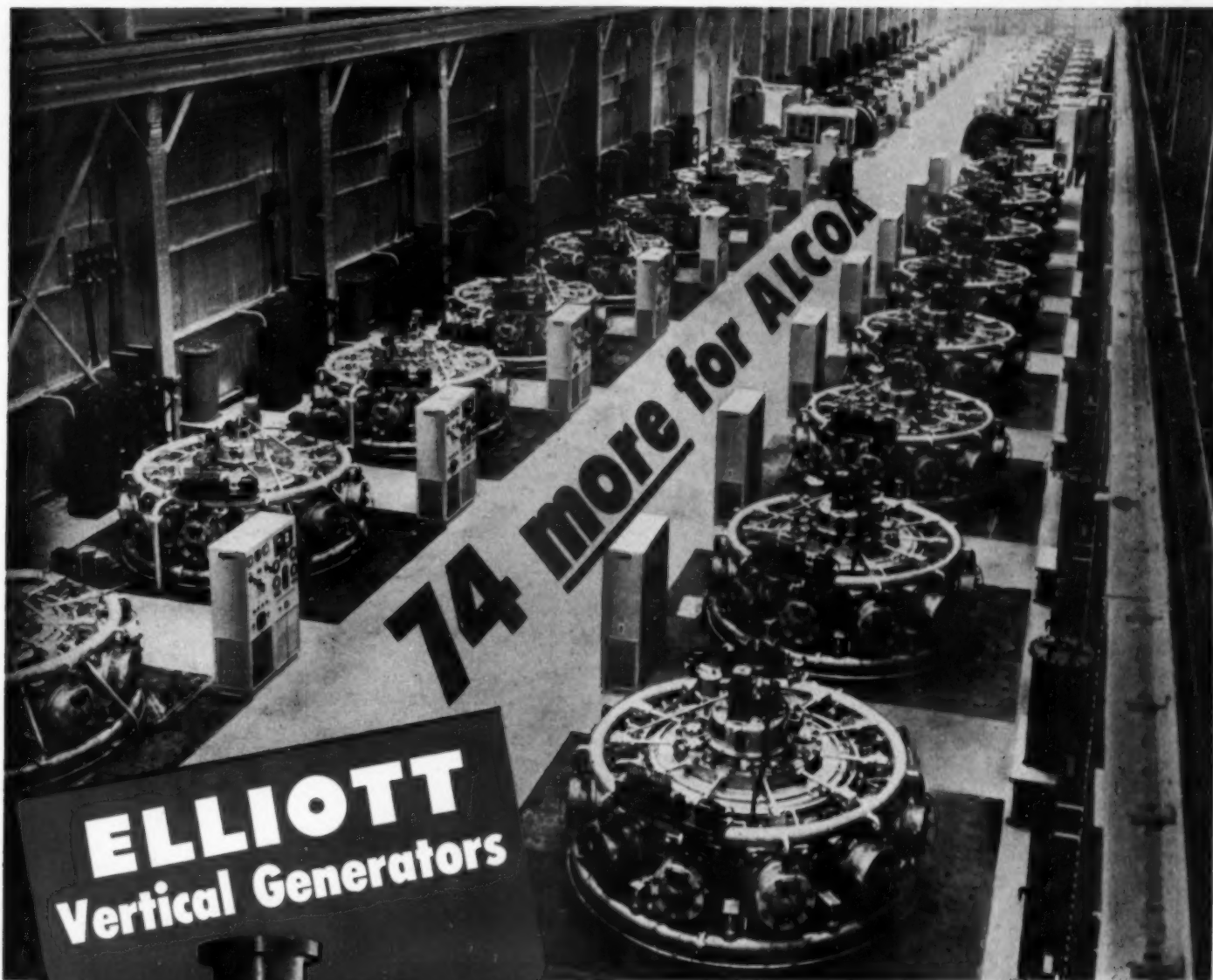
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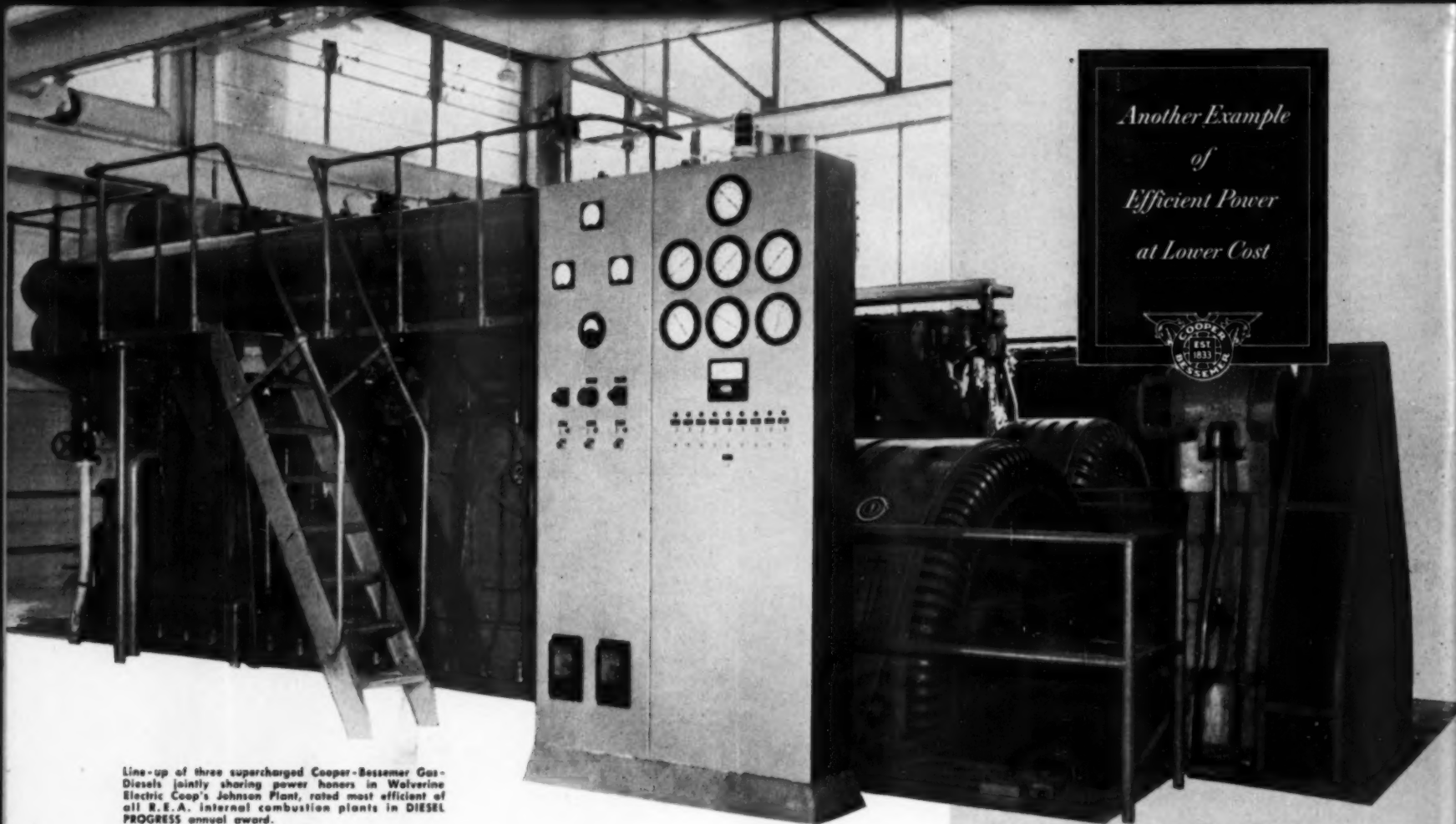
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★ WESTERN MINNESOTA POWER COOP.

Pope Plant, Benson, Mich.
Net KWH 13,992,000
Adjusted net power cost . . . 7.20 mills per KWH

★ THUMB ELECTRIC COOP. OF MICH.

Huron Plant, Caro, Mich.
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Adjusted net power cost . . . 7.71 mills per KWH

WESTERN FARMERS ELECTRIC COOP.

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